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Table of Contents

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ORIGINAL ARTICLES— PAGE.
"The Technical Defects of Gastro-Jejunostomy," by H. C. RUTHERFORD DARLING, M.D., M.S. F.R.C.S. .. 33
"Notes on the Treatment of the Intestinal Parasitic Worms which may be met with in Australia," by G. M. HEYDON, M.B., Ch.M., D.P.H., D.T.M. & H. .. 39
"Radiotherapy as an Aid to Oto-Rhino-Laryngology," by J. G. EDWARDS, M.B., Ch.M. 44
"Experimental Radical Mastoidectomy," by ERIC W. GUTTERIDGE, M.D. .. 47
"The Principle of Intratracheal Anæsthesia," by A. B. K. WATKINS, M.S., F.R.C.S. .. 48

REPORTS OF CASES—
"Rupture of the Bowel from an Injury to the Groin," by STUART GIBSON, M.C., M.B., Ch.B.. 50
"Whole Blood from a Convalescent Patient used in Prophylaxis of Measles," by JEAN MACNAMARA, M.D. .. 50
"Acute Torsion of the Spermatic Cord, Associated with Congenital Inguinal Hernia in an Infant," by REG. E. NOWLAND, M.C., M.B. .. 51

REVIEWS—
Guy's Hospital Reports .. 51
A Year's Progress in Therapeutics .. 51
The Vegetative Nervous System and Disease .. 52

LEADING ARTICLES—
Branches and Divisions .. 53

CURRENT COMMENT—
Treatment of Intestinal Parasites .. 54
Eosinophile Cells in Achylia Gastrica .. 55

ABSTRACTS FROM CURRENT MEDICAL LITERATURE—
Morbid Anatomy .. 56
Morphology .. 57

BRITISH MEDICAL ASSOCIATION NEWS— PAGE.
Scientific .. 58
Nominations and Elections .. 61

UNIVERSITY INTELLIGENCE—
The University of Sydney .. 61

CONGRESS NOTES—
The Australasian Medical Congress (British Medical Association) .. 61

POST-GRADUATE WORK—
Course in Obstetrics and Gynæcology in Melbourne .. 62

PUBLIC HEALTH—
The Health of Australia .. 62

CORRESPONDENCE—
Pituitrin in Obstetrics .. 62
Hospital Practice .. 63

OBITUARY—
Herbert Clatworthy .. 63

HONOURS—
Birthday Honours .. 63
The Kaisir-I-Hind Medal .. 63

NOTICE .. 64

HOSPITAL SATURDAY FUND IN NEW SOUTH WALES .. 64

BOOKS RECEIVED .. 64

MEDICAL APPOINTMENTS .. 64

MEDICAL APPOINTMENTS VACANT, ETC. .. 64

MEDICAL APPOINTMENTS: IMPORTANT NOTICE 64

DIARY FOR THE MONTH .. 64

EDITORIAL NOTICES .. 64

THE TECHNICAL DEFECTS OF GASTRO-JEJUNOSTOMY.[1]

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GASTRO-JEJUNOSTOMY, the keystone of gastric surgery, still remains unchallenged as the operation of choice in the great majority of cases of chronic gastro-duodenal ulceration. This operation, performed in appropriate conditions and in a skilful manner, should be curative in the majority of cases of duodenal ulcer (85% to 95%) and bring about permanent healing in many cases of chronic gastric ulcer (75% to 85%), but it necessarily fails in adherent penetrating ulcers, ulcers remote from the pylorus and those that have undergone malignant degeneration.

In certain cases this operation may be combined either with pyloric occlusion, excision of an ulcer or with sequestration or cauterization of an ulcer, but the fitting procedure for each individual case can be determined only upon opening the abdomen.

[1] Submitted for publication on January 7, 1926.

The mechanism of its beneficial action is not even yet beyond discussion, but the generally accepted explanation is that gastro-jejunostomy produces a cure, not by its mere mechanical action, but by changing the chemistry of the stomach, thus overcoming the relative hyperacidity.

The modifications of the symptoms and secretions after gastro-jejunostomy would appear to be due to three causes: (i.) the relief of the pyloric spasm; (ii.) the hyperacidity is reduced owing to the inflowing of the alkaline jejunal contents; (iii.) the emptying time of the stomach is shortened, provided the pylorus has not been occluded and there is no atony.

The sequelæ of gastro-jejunostomy are many and although a small group of these are at the present time unavoidable, such as ulceration of the jejunum proper (0·1%), retrograde (ascending) intussusception of the jejunum and malignant degeneration (0·78%) of an old ulcer, the majority of these disturbances should be avoidable in skilful hands.

These imperfect results comprise in the aggregate a group which, although small compared to that in which results have been permanently satisfactory, is sufficient to form an apparent basis for

criticism of the operation and also to present problems difficult of solution to the surgeon. It is hardly necessary to state that within the compass of one paper such a review can only be general and that this paper is but introductory to the subject.

The Causes of Bad Results.

These unsatisfactory results may be due to: (i.) improper technique: the surgeon may be at fault on account of some defect in technique; (ii.) improper selection of cases: gastro-jejunostomy ought never to be performed without first verifying the clinical diagnosis by finding a demonstrable ulcer, because such conditions as visceroptosis, gastric atony and many other like conditions which mimic gastric ulcer very closely, are ultimately made worse by gastro-jejunostomy in the majority of instances. A chronic gastric ulcer, regardless of its size, rarely escapes recognition if a careful search be made for it, not only on account of the induration about the crater, but also because of the characteristic changes in the peritoneal coat at the site of the lesion. In a number of cases it has been necessary to cut off and close a gastro-jejunostomy which has been made, although no ulcer was present, the patient being in a far worse condition than prior to the anastomosis. These cases are a discredit not to surgery but to the surgeon.

The unsatisfactory results may also be due to (iii.) failure of the surgeon to direct properly the post-hospital treatment. Gastro-jejunostomy simply removes the cause of the symptoms and the patient must be carefully and judiciously treated for months and occasionally for years before being considered cured in the sense of being permitted to live and eat without guidance. In other words these cases must be systematically checked postoperatively, as regards symptoms, chemistry and X ray findings. Frequently the consequent success or failure depends upon this postoperative management. By working on the theory of cell activity and its control by types of food, Sippy, taking advantage of the action of fats in delaying digestion and reducing the acidity, with the additional administration of alkalis, has developed a very good system of control by variation in diet and frequency of administration of food.

The better education of the patient is much to be desired and written instructions as to diet and mode of life should always be given after gastro-jejunostomy.

There is also (iv.) failure to remove other conditions, notably septic foci in the tonsils and teeth, appendicitis and cholecystitis, which frequently accompany gastric ulcer and probably bear a causal relation to it. In every case of gastro-duodenal ulcer it is the surgeon's duty to make a complete examination of the whole abdominal cavity before embarking upon any set procedure and no operation can be considered complete unless the gall bladder and appendix have been inspected and removed unless normal.

The technical success of a gastro-jejunostomy depends in the main part first upon the position of the stoma in the stomach and second upon the exact point selected in the jejunal loop for the said anastomosis. In other words the loop of the jejunum may be too long or too short, causing kinking or tension; the opening may be too small; it may be situated too high in the stomach and allow a pouch to form below it. It is now a quarter of a century since Peterson first advocated the operation of posterior "no loop" gastro-jejunostomy. During this period the operation has been demonstrated to be an eminently successful procedure in cases of proved ulcer or of pyloric obstruction due to ulcer.

The above terminology, however, is not strictly accurate, for it is impracticable to make the anastomosis immediately adjacent to the duodeno-jejunal junction. In practice about five to seven and a half centimetres (two to three inches) of jejunum intervene between the origin of the jejunum and the point at which the junction is made. In former times when gastro-jejunostomy was chiefly undertaken for pyloric obstruction, the opening was placed near the pylorus in order to secure drainage. With the modern operation of posterior no-loop gastro-jejunostomy, however, the opening cannot be made close to the pylorus. In this operation the stoma is usually placed as near the cardia as possible, so as to insure the greatest amount of neutralization of the stomach contents. The opening should always be large, not less than five to six centimetres (two to two and a half inches) in length, that is the resulting opening should be just large enough to admit easily two average-sized fingers.

It is best placed in line with the œsophagus and should always reach the greater curvature.

Whether the direction of the stoma is vertical or inclines from left to right—isoperistaltic—or from right to left—retroperistaltic or antiperistaltic (Mayo)—matters very little as the results of all three methods seem to be equally satisfactory. The vertical opening, however, is probably more commonly adopted at the present day chiefly owing to the fact that extension to the greater curvature is more readily obtainable by making use of this incision. The physical characteristics of the stoma are important; no spur should be created nor should there be a superabundance of gastric mucosa which may fall across and act as a valve. Finally it must be borne in mind that practically nothing passes through the stoma unless directly pushed through by the normal peristaltic efforts of the gastric muscle; the opening does not act like the bung hole in a barrel, in spite of the fact that the stoma exerts no sphincter action similar to that of a normal pylorus. Physiological investigation indicates that the stomach consists of two parts, the cardiac part acting as a reservoir and the pyloric portion acting as a propulsive or motor organ.

Von Pfungen in 1887 measured the intragastric pressure in a boy with gastric fistula. He showed that the pressure in the cardiac end varied from five to ten millimetres, whilst in the region of the pylorus the pressure was greatly increased and varied from forty to eighty millimetres of mercury in connexion with its peristaltic contractions. To

permit of gastric contents passing into the jejunum, the pressure to which it is subjected, must be greater than that of the intestinal contents.

A decade ago Hartmann demonstrated that the evacuation of the gastric contents was chiefly through the stoma if the opening be situated in the pyloric antrum and through the pylorus if situated in the cardiac part of the stomach. It appears that a juxta-pyloric anastomosis works actively even when the pylorus is normal; conversely an anastomosis in the cardiac end will be more or less functionless in cases of a permeable pylorus.

These different modes of gastric evacuation according to the position of the artificial opening probably find a partial explanation in the differences of muscular contractions in the different zones of the stomach. But it is definitely known that juxta-pyloric ulcers are accompanied by a spastic contraction of the pyloric muscle which is more or less constant and leads to partial pyloric stenosis. Hence the gastric contents would tend no longer to pass through the pyloric orifice but through the new stoma. After healing of the ulcer has taken place (if it does), the spasm of the pyloric sphincter relaxes and the food tends to revert back to the pylorus, this now being patent for its exit.

Unfortunately in the pathological conditions of the stomach the evacuation of barium does not always take place in the same way. Sometimes the passage is almost immediate; in other cases the passage takes place by instalments which succeed each other at short or long intervals; in some cases the evacuation begins with a gush and continues by repeated instalments.

Amongst the unpleasant after-effects of gastro-jejunostomy more especially if the opening be made in the pyloric antrum, is too rapid emptying of the stomach (dumping stomach), which tends to induce abdominal discomfort and diarrhœa. On examination by X rays the stomach is usually found to be small and hypertonic and to be evacuating its contents too rapidly into the small intestine.

Considerable improvement is generally obtained if the patient be instructed to lie down half an hour after each meal.

Technical Errors in Connexion with the Stoma.

Unsatisfactory results directly traceable to the stoma may be due either to the opening being too small or to the opening being badly placed.

The Size of the Stoma.

In the early days of gastro-jejunostomy contraction of the stoma was not uncommon, but this was generally due to the use of mechanical devices. By modern methods of operating contraction of the stoma should not occur, unless a gastro-jejunal ulcer be present as a complication. In cases where a large horizontal stoma has been made, the jejunum may prolapse through the opening into the stomach in a similar manner to that occasionally seen after colostomy. The symptoms and sudden onset of this condition suggest acute obstruction of the jejunum. It is probably the initial stage of a jejuno-gastric intussusception.

Case Illustrating Contraction of the Stoma.

A salesman, aged thirty-seven years, had gastro-jejunostomy performed for juxtapyloric ulcer twelve years previously and was in good health until four months before operation when he began to complain of sharp, stabbing pains in the epigastrium about twenty minutes after a meal. The pains increased both in duration and in severity and at the time of operation lasted on an average two or three hours. During the previous three months he has vomited about three-quarters to one litre of brownish frothy fluid about once or twice a week, usually about three hours after a meal. During the three months before operation he lost 6·35 kilograms (a stone) in weight. In an attack of pain the stomach occasionally stood out prominently and peristaltic waves could be noticed passing from left to right. At operation the stomach was found to be large and hypertrophied and the pylorus, when separated from the old adhesions in which it was embedded, was found to be much thickened and stenosed. The gastric stoma was greatly contracted, being reduced to the diameter of the end of a lead pencil.

The stoma was enlarged by the transgastric method and the patient made an uninterrupted recovery.

Location of the Stoma.

In certain cases gastro-jejunostomy has been followed by ill-defined symptoms and X ray examination has shown that the stoma is relatively high up, for example, midway between the curvatures and the barium accumulates in a pool below the false opening. The treatment of these cases should be directed towards improving the tone of the gastric musculature. Considerable improvement is obtained if the patient be fitted with an abdominal support and instructed to lie down for half an hour after each meal.

Technical Errors in Connexion with the Jejunal Loop.

Mechanical Obstruction of the Proximal Loop Between the Duodeno-jejunal Flexure and the Opening in the Stomach.

With the modern methods of operating the condition known as *circulus vitiosus* is almost unknown, but one still meets occasionally with patients who have almost continuous vomiting, chiefly of bile. Such an occurrence points to some mechanical obstruction in the neighbourhood of the anastomosis and if washing out the stomach fails to relieve, surgical measures to deal with the obstacle are indicated. The obstruction is generally found to arise from one of three causes. The jejunal loop may be of insufficient length to allow it to be brought over to the pyloric portion of the stomach without tension and a kink may develope at the duodeno-jejunal junction.

An exaggerated mesocolic ligament (Treitz) may have been divided at the original operation and the raw surface left may subsequently give rise to adhesions which cause obstruction at the duodeno-jejunal junction.

There may be accidental twisting of the jejunum on its longitudinal axis during the process of suturing or flattening of the jejunum by the inclusion of too much tissue in the sutures.

Owing to the shortness of the afferent loop the remedial entero-enterostomy is made much more difficult than was the case under the old obsolete

long loop operation; for example, a man, aged thirty-three years, had had posterior "no loop" gastro-jejunostomy performed at another hospital ten weeks previously for duodenal ulcer. Although relieved of his original symptoms he complained of the vomiting, either daily or every alternate day, of a large quantity (a half to one litre) of bilious fluid which, however, contained no food particles. Gastric lavage failed to relieve the condition and it was further noticed that at times he vomited half a litre of bright yellow bile within half an hour of the lavage. At the second operation the adhesions were found to be so dense around the proximal five centimetres of the jejunum that an attempt to free this loop would necessarily prove unsuccessful. As the duodenum was distended from the accumulation of fluid, a lateral anastomosis was made between the ascending portion of the duodenum and the jejunum about six and a half centimetres (two and a half inches) below the gastro-jejunal anastomosis. The patient made an uninterrupted recovery, the vomiting ceased and seven months later he had gained 11·3 kilograms (twenty-five pounds) in weight.

Bartlett has described an ingenious method of performing duodeno-jejunostomy by aid of a Murphy's button in this particular type of case. I was unfortunate in not knowing this method when attending the above patient. It consists of trans-gastric exposure of the gastro-jejunostomy opening and then with a hysterectomy clamp one-half of a Murphy's button is introduced through the stoma into the duodenum and the other half into the jejunum. Two small incisions are made through the intestinal walls exposing the neck of each half of the button and the duodeno-jejunostomy is completed by telescoping the two halves of the button. Bartlett's method is easy to accomplish, the only difficulty being the adequate protection of the operation field with abdominal packs.

Posterior "Long Loop" Gastro-jejunostomy.

In 1885 von Hacker introduced posterior gastro-jejunostomy in which an anastomosis was made about twenty to twenty-two and a half centimetres (eight to nine inches) from the duodeno-jejunal flexure, but the results were unsatisfactory (38·7% mortality) chiefly on account of kinking of the jejunum at the anastomosis, the kinking being aided if not actually produced by the weight of the long afferent loop. In spite of this observation of our forefathers, proved to be correct in 1917 by experimental work, one not infrequently finds on reexamining the abdomen of patients on whom gastro-jejunostomy has been previously performed, that the anastomosis is placed inches, feet or even yards from its proper site on the jejunum. Posterior gastro-jejunostomy with a long loop may lead to *circulus vitiosus* or to intussusception of the proximal loop into the stomach.

Circulus Vitiosus.—If a pylorus be patent, food will pass through it even after gastro-jejunostomy and will appear in the afferent loop. If there is no free outlet to the efferent loop, the duodenum and jejunum above the stoma will become distended. In vicious circle the afferent loop becomes so ballooned that the efferent opening is pushed out of the way and becomes more or less shut off by a spur.

Jejuno-gastric Intussusception.—During the last two years three cases of jejuno-gastric intussusception following gastro-jejunostomy have been recorded and recently one patient suffering from this condition came under my care at the Coast Hospital.

A male labourer, aged fifty-five years, who had had gastro-jejunostomy performed at another hospital five years previously for "gastric ulcer," was admitted into the Coast Hospital suffering from "intestinal obstruction." Following an attack of diarrhœa of eighteen hours' duration he was suddenly seized forty hours before admission with severe cramping pains in the epigastrium, associated with vomiting first of food and bile and later of blood. The severest pain came on in spasms, but it also had been continuous up to the time of his admission. The vomiting was frequent and consisted of dark coloured liquid blood with an extremely foul odour. The bowels had moved twenty-seven hours previously, but since then there had been inability to pass either flatus or fæces. On examination the facial aspect denoted that the patient was extremely ill. His temperature was 36·4° C. (97·6° F.), his pulse rate 120 and his respirations 36. The extremities were cold and the skin clammy. The tongue was very dry and heavily coated and the breath most offensive. The abdomen was neither distended nor rigid, but the respiratory movements were considerably restricted and in the left hypochondrium was seen a swelling which appeared to be a dilated and distended stomach. This swelling was due to an extremely tender, indefinite, elongated mass, tympanitic to percussion, about the size of a fist; it could be felt distinctly above and to the left of the umbilicus.

The abdomen was opened and the stomach was found to contain a large sausage-shaped tumour. On turning up the colon the origin of an enormously distended jejunum was soon identified, running vertically upwards from the duodeno-jejunal flexure through a rent in the transverse mesocolon to the stoma in the stomach, to enable it to become continuous with the sausage-shaped mass in that viscus. Lying posterior to this short segment of distended bowel was found the collapsed efferent loop.

The intussusception was reduced with great difficulty by a combination of squeezing and traction and it was then found that a posterior gastro-jejunostomy had been performed with a loop 83·8 centimetres (two feet nine inches long) and the proximal jejunal loop had intussuscepted for some 76·2 centimetres (two feet six inches) into the stomach through the gastro-jejunostomy opening. The reduced gut was enormously distended being three or four times its normal size and having its walls very œdematous; there were areas of hæmorrhage. There was lack of pulsation in the vessels supplying the upper ten centimetres (four inches) of the loop. Owing to the man's shocked condition, resection was out of the question, so entero-anastomosis was performed with a Murphy's button ten centimetres below the stoma. The patient grew worse in spite of stimulants, radiant heat and saline infusion and died seven and a half hours after the termination of the operation.

The stoma was situated on the posterior wall of the stomach about six and a quarter centimetres (two and a half inches) above the greater curvature, was horizontal in direction and admitted two fingers.

Gastro-ileostomy.—The accidental suture of the stomach to the ileum is alleged to be followed either by true stercoraceous vomiting or by pseudopancreatic diarrhœa, with which is associated rapid and progressive loss of weight. The amount of food passing through the pylorus in these cases is usually very small, being just enough to prevent starvation and hence it may be possible for the patient to survive for one or two years after this operation. When a gastro-

ileostomy anastomosis is disconnected, the stomach is capable of taking care of itself, provided it is disconnected, released from any adhesions present and properly closed, but the closure of the ileum is apt to result in the formation of a stricture.

The most important step is freeing the mesocolon which is usually intimately attached to the anastomosis. This dissection should be commenced on the posterior aspect of the stoma; when the posterior wall of the stomach has been exposed, the index finger should be inserted between this viscus and the mesocolon and with the finger as a guide the mesocolon should be loosened and dissected from the stomach. The disconnecting incision should then be made on the stomach wall one and a quarter centimetres away from the anastomosis, leaving a cuff of stomach entirely surrounding the false opening in the ileum. When the latter opening is closed, there is just sufficient excess to bring the bowel to its normal lumen by one or possibly two rows of Lembert's sutures.

The opening in the mesocolon is closed to prevent hernia and the operation is then complete.

A woman, aged thirty-five years, had gastro-enterostomy and cholecystectomy performed for gastric ulcer and gallstones respectively, at another hospital one year previously. Since the operation she complained of a constant "burning bursting" epigastric pain, increasing progressively in severity and with exacerbations coming on about one hour after food. There was a tender area in the middle line just above the umbilicus.

She had always suffered from constipation, but for the last year this had been most obstinate and had been associated with alternating attacks of diarrhœa, during which practically an entire meal of almost unchanged, masticated food (chyme) would be passed some three to four hours after ingestion. During the last year she had lost 15·9 kilograms in weight. There was no history of jaundice, vomiting or hæmatemesis, but nausea and flatulent dyspepsia were constantly present.

On X ray examination the barium could be seen escaping partly through the pylorus and partly through the stoma and the caecum and ascending colon were well filled within three or four hours.

A provisional diagnosis of chronic pancreatitis was made and the patient was advised to undergo laparotomy, with the idea that choledochostomy should be performed should it be indicated. Operative measures were refused and the patient ultimately succumbed. A limited *post mortem* examination was performed. The pylorus readily admitted the tip of the index finger, but no evidence of any previous ulceration in the stomach or duodenum was discernible. An anastomosis had been performed between the posterior wall of the stomach and the ileum some forty-five centimetres (eighteen inches) from the ileo-caecal valve. The stoma was in connexion with the pyloric antrum and admitted two fingers.

A woman, aged fifty-two years, who had had a gastric ulcer excised and posterior gastro-enterostomy performed at another hospital eleven weeks previously, was admitted to the Coast Hospital with the provisional diagnosis of chronic intestinal obstruction.

Since her discharge from the Walker Convalescent Hospital one month previously she had been complaining of progressive loss of strength and the vomiting of a moderate quantity of partially digested food about half an hour after each and every meal. Immediately after food she had experienced a sense of fullness in the epigastrium, but there had been a total absence of pain. With the exception of an occasional attack of diarrhœa the bowels had been open once or twice daily throughout her convalescence.

On admission the patient was found to have a moderate covering of subcutaneous fat. Her temperature was normal; her pulse 104 and her respirations 22. The abdomen was neither distended nor rigid nor was any tenderness to be located. On examination by X rays the stomach was seen to be evacuating its contents so rapidly that it was impossible to obtain an outline of this viscus. The condition was thought to be one of "dumping stomach" and on treatment with dry diet, the inevitable bismuth mixture and gastric lavage the vomiting was reduced till it occurred after about one meal a day. The vomit was furthermore reduced in quantity, nonoffensive and consisted of partially digested food. Gastric lavage yielded a few ounces of undigested food. The patient gradually went downhill and died on the twenty-seventh day after admission.

A limited *post mortem* examination was performed. The pylorus had been excised and a posterior gastro-enterostomy had been performed between the pyloric antrum and the ileum some 25 centimetres (ten inches) from the ileocaecal valve. The large bowel was moderately distended.

A simple free Meckel's diverticulum 3·75 centimetres (one and a half inch) long and 1·8 centimetre (three-quarters of an inch) wide was found projecting from the free border of the ileum about 27·5 centimetres (eleven inches) above the anastomosis.

Technical Errors in Connexion with the Transverse Mesocolon.

Several cases of intestinal obstruction after gastro-jejunostomy have been recorded arising from a loop of bowel passing either through a rent in the mesocolon or through the jejuno-gastric hiatus.

Hernia Through the Transverse Mesocolon.

A portion of small intestine sometimes slips through a slit or tear in the transverse mesocolon and becomes obstructed or strangulated.

The edges of the opening made in the transverse mesocolon through which the stomach is brought out posteriorly in the operation of gastro-jejunostomy, should therefore always be sutured either to the line of anastomosis (Mayo) or preferably to the posterior wall of the stomach at a little distance (one or two centimetres) from the gastro-jejunal anastomosis.

There is also an added danger that an unclosed aperture in the mesocolon may slip down and approximate the afferent and efferent loops of the jejunum and thus kink the gut at the site of anastomosis. It has been suggested that idiopathic hernia through the transverse colon into the omental bursa occurs only in the presence of mid-line enteroptosis. In a normal abdomen when there is a sharp rise of intraabdominal pressure, as in vomiting, the stomach and colon are forced more firmly into the upper or supracolic compartment of the abdomen and there support the transverse mesocolon against the upward pressure of the small intestine. In mid-line enteroptosis not only is this support lacking, but the weight of the stomach and colon crowds the small intestine upwards under the stretched transverse mesocolon, thereby increasing the upward thrust of expulsive effort with possible rupture.

Jejuno-gastric Strangulation.

In rare instances a loop of small intestine may pass through the hiatus which is bounded antero-superiorly by the stomach and transverse mesocolon and postero-inferiorly by the proximal loop of

jejunum which has been brought up and attached to the stomach.

At the commencement of this paper certain of the sequelæ of gastro-jejunostomy were stated to be unavoidable at the present time, but retrograde or ascending intussusception and ulceration of the jejunum are of such importance as to deserve special mention.

Retrograde or Ascending Intussusception of the Distal or Efferent Loop.

Retrograde or ascending intussusception of the jejunum through a gastro-jejunostomy stoma is now a well recognized complication, but the chief interest in this condition lies in the difficulty of explaining the factors which are responsible for its occurrence. It does not appear to matter which type of gastro-jejunostomy has been performed nor does the condition appear to be dependent upon the position of the stoma, but nevertheless gastro-jejunostomy appears to be in some way the primary cause of the condition.

The condition is alleged to be due to too rapid emptying of the stomach, which causes irritation of the jejunum and sets up forcible antiperistalsis. The condition is characterized by sudden griping, epigastric pain, vomiting of blood, often a palpable tumour in the left hypochondrium with absence of rigidity, distension and acute tenderness. Some eighteen cases have now been recorded. The treatment, as in all forms of intussusception, is immediate laparotomy.

Postoperative Ulceration of the Jejunum.

Postoperative ulceration of the jejunum formerly occurred in 5% or 6% of all patients subjected to gastro-jejunostomy, but with greater care better operative technique and absorbable suture material probably not more than 2% result from it today. The division of postoperative ulceration into true jejunal ulceration, in which one or more ulcers form in the jejunum at some distance from the anastomotic opening, and gastro-jejunal or stomatal ulceration, in which the ulceration occurs on the line of the anastomosis, is of the utmost importance.

Jejunal Ulcers.

Jejunal ulcers nearly always occur opposite the stoma in that descending or efferent loop of the jejunum and are probably due to imperfect neutralization of the gastric hyperacidity, associated either with failure to discover the original cause of the ulcer (a fresh infection originating another ulcer in the vicinity of the new opening) or possibly the vitality of the jejunum has been lowered mechanically by the trauma induced by two tight clamps. The late A. J. Ochsner was of the opinion that these ulcers followed gastro-jejunostomy when the opening was not at the lowest point in the stomach, so that acid contents could accumulate, thus reproducing the condition which caused duodenal ulcer in the first place.

Gastro-jejunal Ulcers.

Gastro-jejunal, stomatal or marginal ulcers are probably due to a failure of the gastro-jejunostomy wound to heal completely. It must be remembered that an ideal gastro-jejunal anastomosis will be the site of a healing ulcerated surface for fourteen days and for the first five or seven days the process is largely destructive, at least as far as the mucosa is concerned. Definite hyperacidity of the gastric contents, trauma, for example, from solid food passing over the granulating area and the presence of an unabsorbable suture in the granulating area, all tend to delay this repair which is normally complete in from twelve to fourteen days.

But there must be an added ætiological factor in the production of these ulcers, for although the control of all the above causes materially reduces their incidence, it will fail to prevent their occurrence entirely. The majority of these ulcers occur in men and in most instances symptoms develope within the first two years after gastro-jejunostomy. The symptoms are quite like those from which the patient was suffering before the primary operation; this shows that the same disturbance may come on with suture ulceration as that manifested by the original lesion. X ray examination offers the most accurate method of differential diagnosis.

A gastro-jejunal ulcer is more resistant to treatment and the temporary relief which often follows the medical treatment of primary ulcer, is not often obtained. When such relief is experienced, the prompt reappearance of the pain on the return to a normal diet, is of diagnostic significance. The patient with ulceration of the jejunum is in a much worse state than with gastro-duodenal ulceration, for this is not only a more crippling complaint, but a very formidable operation is necessary to cure it.

Gastro-jejunal ulceration may be treated by trans-gastric excision or excision of the entire anastomosis.

Flint points out that an ulcer at the line of anastomosis never occurs after gastro-duodenostomy; hence he advocates excision of the gastro-jejunal or jejunal ulcer, suture of the openings in the stomach and jejunum and the performance of gastro-duodenostomy.

A solicitor's clerk, aged forty-two years, had posterior "no loop" gastro-jejunostomy performed at another hospital six years ago for chronic duodenal ulcer. He remained in good health for nearly five years. For the last year he had complained of attacks of pain following food and there was a tender area under the upper part of the left rectus near the costal margin. The pains appeared always at the same point and after a similar interval, but the interval was shortest after a small meal and longest after a heavy one.

On X ray examination the barium could be seen escaping partly through the pylorus and partly through the stoma. Gastric analysis after a test meal revealed a total acidity of 60, combined acidity of 48, free hydrochloric acid of 40.

At operation the scar of the original ulcer in the duodenum was visible. The pylorus readily admitted the index finger on invaginating the stomach through it. The gastro-jejunostomy opening was midway between the two curvatures and easily admitted two fingers. The anterior surface of the jejunum immediately distal to the anastomosis was adherent to the wall of the stomach about 3·75 centimetres from the line of union. On separating the adhesion which was comparatively recent, a perforation was found in the jejunum about one and a quarter centimetre (half an inch) from the anastomosis. The

ulcer of which the perforation was the centre, was excised together with the line of anastomosis adjacent to it. The opening in the two viscera thus made was closed by the usual suture method, reestablishing the stoma. Convalescence was uninterrupted, the patient was in good health for sixteen months and then succumbed to lobar pneumonia.

Conclusions.

In conclusion I wish to point out that every patient who has had a gastro-jejunostomy performed, should have full instructions as to his diet and habits of eating. The physician and the surgeon in cooperation can accomplish results impossible of attainment for either alone. Many of the troubles encountered by the patient and many of the reflections cast upon the surgeon are due to lack of supervision and advice following the mechanical work of surgery.

The physician and surgeon, each of whom should be thoroughly conversant with the indications and limitations of both the medical and the surgical treatment, should enter into the closest cooperation, not competition. The results of gastro-jejunostomy are not perfect and no such claim should be made at the present time for this or any other treatment for chronic gastro-duodenal ulcer. On the other hand a recent writer of the European school of radical gastric surgery claims that gastro-jejunostomy is a disease. If this hypothesis be correct, at least this operation has the virtues of being both preventible and curable.

After all is said and done, that operation for gastro-duodenal ulceration will alone survive which with the smallest risk brings about a complete subsidence of all symptoms, a permanent freedom from any recurrence and immunity from any disorder associated with the operation in consequence of its mechanical or physiological effects.

NOTES ON THE TREATMENT OF THE INTESTINAL PARASITIC WORMS WHICH MAY BE MET WITH IN AUSTRALIA.

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IT is not always easy to get satisfactory results in the treatment of persons harbouring intestinal worms. To get rid of all the worms is often very difficult. Considerable improvements in the methods of treating some worm infestations have been introduced in recent years. Of the many drugs which may be found recommended in various books of reference, some are certainly not the best for the purpose. In these notes the methods considered to be the best at present known will be indicated. The mere giving of a particular drug in the proper dose is not always all that is needed and lack of sufficient attention to other details of management is sometimes responsible for failure.

The purpose of these notes is to give hints on treatment only and such matters as methods of diagnosis, pathogenesis and prophylaxis are not dealt with. A few remarks on some of these subjects, however, and on other matters of interest have been included.

The parasitic worms of man belong to one of three groups. These are the flukes (*Trematodes*), the tapeworms (*Cestodes*) and the round worms or thread worms (*Nematodes*). Fortunately none of the flukes which commonly parasitize man, are endemic in Australia at present, although they may be met with occasionally in Asiatic immigrants. Only the other two groups, the round worms and the tapeworms, will be considered here.

Round Worms and Thread Worms (Nematodes).

The following are the intestinal nematode parasites with which we are concerned:

The hookworms, *Anchylostoma duodenale* and *Necator americanus; Ascaris lumbricoides; Enterobius vermicularis* (*Oxyuris vermicularis*); *Trichuris trichiura* (*Trichocephalus dispar*); *Strongyloides stercoralis* (*Strongyloides intestinalis*).

The hookworms, the normal host of which is man, are the two species *Anchylostoma duodenale* and *Necator americanus*. Both species may be found in those parts of Australia where hookworm is endemic, those parts with suitable conditions of temperature and rainfall, but *Necator americanus* is much the more common. The distribution of hookworm infection in Australia has been determined by the surveys of the Australian Hookworm Campaign and some light thrown on the regional and racial distribution of the two species. They found *Necator americanus* to be predominant in most of the endemic areas and *Anchylostoma duodenale* mainly in the extreme north-western part of Queensland and the endemic areas of Western Australia and the Northern Territory (also in certain institutions outside the endemic area). *Anchylostoma duodenale*, however, is the predominant hookworm in Southern Europe and it is likely that the many Southern Europeans who enter areas suitable for the spread of hookworm, such as the sugar districts of Queensland are importing many anchylostomes to mingle with the necators formerly introduced by the kanakas. Several patients, Spaniards and Italians, have recently been investigated at Townsville, who were suffering severely from hookworm disease and who had heavy and in some instances pure infections with *Anchylostoma duodenale*. They were workers on the sugar farms of the North Queensland coastal districts. They had apparently acquired their heavy infections there from soil infected by their compatriots.

Information is lacking on the question, ethnologically interesting, of the species of hookworm, if any, originally harboured by the aborigines of North Australia. In more recent times *Necator americanus* was introduced into Australia by the kanakas from the Pacific islands, *Anchylostoma duodenale* by Chinese and Southern Europeans.

What is seldom sufficiently recognized, is that there is a very great difference in pathogenicity between the two worms, *Necator americanus* being much less harmful than *Anchylostoma duodenale*.

The chief drugs which have been used by the Hookworm Campaign of the Rockefeller Foundation since its inception are thymol, oil of chenopodium, carbon tetrachloride and a mixture of carbon tetrachloride with oil of chenopodium. These four have succeeded one another in this order, which is that of their value against hookworms. Only oil of chenopodium and carbon tetrachloride and the combination of these two will be discussed here. Thymol, as well as other drugs such as β naphthol, chloroform and eucalyptus which have been used and advocated, must now be recognized to be all inferior to the first two mentioned.

The two species of hookworms differ not only in pathogenic power, but also in their resistance to drugs. *Anchylostoma duodenale* which is the most harmful, is also the harder to eradicate. Carbon tetrachloride is highly efficient against *Necator americanus,* but less so against *Anchylostoma duodenale.*

Oil of chenopodium and other anthelmintics also remove *Necator americanus* more easily than they do *Anchylostoma duodenale,* but the difference is not so pronounced as with carbon tetrachloride. As against *Anchylostoma duodenale* carbon tetrachloride alone is probably not much, if at all, more effective than oil of chenopodium alone. Carbon tetrachloride tends to be selective against female hookworms, oil of chenopodium against male.

A saline purge after these drugs is always necessary; it should be large, thirty grammes (one ounce) of magnesium or sodium sulphate for an adult and it is advisable to ascertain whether it has acted and to repeat it at once if it has not done so within a few hours. The drugs are best given on an empty stomach. Preparation by fasting or light diet before the day of medication is not necessary. Neither is a preliminary purge the day before treatment imperative and it has been proved that its omission has little effect on the result obtained, especially with carbon tetrachloride. But it is often advisable to give it, especially when there is constipation, if only to insure that the purge which follows the drug, will be able to act quickly. Rest in bed on the day of treatment is very often omitted with little risk, although preferable when it can be secured. The patient may take food as soon as the bowels have acted well.

In practice it is found that the administration of these and other anthelmintics personally or under proper supervision yields far more satisfactory results than the mere giving of a prescription and directions.

Some further details concerning each of these three medicines in turn, will now be mentioned.

Carbon Tetrachloride.

Carbon tetrachloride is the best drug against necators; a single dose usually removes more than 90% of these worms. It is also efficient to a lesser degree against anchylostomes.

The dose for an adult is from two to three cubic centimetres (thirty-four to fifty-one minims). Three cubic centimetres are quite safe for a male adult and much larger doses have often been recommended. But the general opinion at present is that it is safer not to exceed three cubic centimetres. The dose for children who stand the drug well, is 0·18 mil (three minims) per year of age. Pregnant women may safely be given carbon tetrachloride.

The drug is best given in the morning on an empty stomach. A preliminary purge the evening before is not necessary. The whole dose is usually given at once in hard gelatine capsules. On account of the volatility of the drug the capsules should be filled at the time they are to be taken. The drug which is not unpleasant, may also be swallowed quite easily in water (in which it sinks and does not mix) and may be given in this way to children. Two hours after the dose a large dose of magnesium sulphate or other purgative not of an oily nature should be given. Carbon tetrachloride has itself a slight laxative effect, but this alone cannot be relied on safely. In the case of carbon tetrachloride the salts may be given at the same time as or shortly before the anthelmintic, instead of afterwards, if it is more convenient, but with children and persons who may vomit a strong dose of salts, it is better not to give them at the same time as the vermifuge, as an unknown amount of the latter is then lost. On no account must any alcohol be permitted on the day of treatment.

The purity of the carbon tetrachloride is of the very utmost importance and many of the accidents have been attributed to impurities such as carbon bisulphide.

Carbon tetrachloride is one of the group of drugs, its relative chloroform being another, of which the toxic action falls mainly on the liver. Shortly after its administration there may be symptoms, usually slight and unimportant, consisting of dizziness and somnolence. The more serious and rarer symptoms are delayed and correspond to those of delayed chloroform poisoning. They are due to damage (necrosis of the central parts of the lobules) to the liver and sometimes to the kidneys. They usually appear on the second and third day; there may be nausea and vomiting, epigastric pain and tenderness of the liver; jaundice may appear and hæmaturia; there may or may not be rise of temperature. The contraindications to the prescription of carbon tetrachloride are liver and kidney disease, but above all alcoholism. Most of the cases of poisoning with moderate doses have either been due to an impure drug or have occurred in chronic alcoholics. It is good practice to prohibit all alcohol for several days before and after the treatment. In a recent circular of the International Health Board it has been pointed out that since the drug appears to have a selective action on the liver as well as on the kidneys, it is advisable to give the patient on the day preceding treatment a diet containing a considerable quantity of carbohydrates, especially sugar, because of their protective action on the liver.

Oil of Chenopodium.

Oil of chenopodium comes next to carbon tetrachloride in efficacy against hookworms in general

and has the advantage of being potent against ascaris as well, for which carbon tetrachloride is of little use. It should not be given to pregnant women. The drug is very unpleasant to take. It may be simply floated on water and swallowed, but is best given in hard gelatine capsules. To children it is often given on sugar. An adult should be given from one to one and a half cubic centimetres (seventeen to twenty-five minims) and a child 0·06 mil (one minim) per year of age.

The drug is more effective if given in two doses than if given all at once and division into three is better still. If 1·5 cubic centimetres (twenty-five minims) are given, they may be administered in three half cubic centimetre (eight minim) doses at intervals of one or two hours, beginning early in the morning. It should be given on an empty stomach and a purge the previous evening is advisable. The last dose should be followed in two or three hours by a large dose of a saline purgative. Castor oil, sometimes recommended, should not be used.

The toxic action of oil of chenopodium is confined to the nervous system. The symptoms of poisoning are dizziness, incoordination, tinnitus, disturbances of vision, formication and tingling of the soles and palms. Coma convulsions and death have been caused by overdoses. Some of the symptoms usually appear early in the rare cases in which any poisoning occurs. The treatment is to administer the purge immediately and of course to omit any portions of the divided dose which have not yet been taken.

Oil of chenopodium is of somewhat variable composition; it is a mixture of oils, some of which have no anthelmintic action. "Ascaridol" is the name which was given by Schimmel and Company who first isolated it, to that fraction of oil of chenopodium which contains the active body. It forms from 50% to 70% of the whole oil. As it is of more constant composition and potency than oil of chenopodium, it is to be preferred if available. Its toxicity as well as its anthelmintic action is higher than that of an equal volume of oil of chenopodium. The dose is half the dose of the whole oil.

A Mixture of Carbon Tetrachloride and Oil of Chenopodium.

Carbon tetrachloride and oil of chenopodium in combination seem to possess decided advantages over either given alone and to be the best medicament for hookworm infection which has been fully tried up to date. The efficacy against both necators and anchylostomes is high and the effect on *Ascaris lumbricoides* is also good. It is true that carbon tetrachloride alone is just as good for pure necator infections, but one can usually only conjecture before treatment which species of worm is present or whether both are, since the predominant species of hookworm present cannot be determined readily by examination of the ova alone.

The toxicities for man of the two drugs are of quite different characters and do not reinforce each other. On the other hand their action on the worms is to some extent complementary. As the dose of each in an effective mixture need not be as high as the effective dose of either given alone, the margin of safety is increased. A dose for an adult of 1·6 cubic centimetres (twenty-seven minims) of carbon tetrachloride with 0·8 cubic centimetre (fourteen minims) of oil of chenopodium or 0·4 cubic centimetre of "Ascaridol" possesses great efficacy with a large margin of safety and is recommended. For children the dose is 0·15 mil (two and a half minims) per year of age of a mixture of two parts of carbon tetrachloride with one part of oil of chenopodium or two minims per year of age of a mixture of four parts of carbon tetrachloride with one part of "Ascaridol." Larger doses have been advised and a full dose of both drugs may be given without undue risk in obstinate cases; for instance for a male adult, three cubic centimetres of carbon tetrachloride with one cubic centimetre of oil of chenopodium (half a cubic centimetre of "Ascaridol"). The mixture should be given in the morning, fasting and be followed in two hours by a full saline purge. Hard gelatine capsules may be used. It is important not to mix the drugs until they are to be used; they must not be kept mixed. Food may be taken as soon as the bowels have acted well.

None of the drugs for hookworms at present known can be relied on to remove every worm present in a single treatment, if only a moderate dose with a large safety margin be used. Such a single treatment usually removes over 90% of necators and the majority of the anchylostomes, but a few worms usually remain. The percentage of worms removed is usually higher in heavy infections than when only a few worms are harboured. It follows that to remove the last worm even by several treatments is often difficult. However it is not necessary in patients with hookworm disease to remove all the worms in order to remove all symptoms and effect a cure. As far as the patient's health is concerned a few worms are of little consequence; the number which is of no practical consequence, is smaller for anchylostomes than for necators. In general ten hookworms or less usually do little harm.

From a prophylactic standpoint it is of course desirable to remove every worm, but the difficulty of doing so is so great that the attempt has been abandoned by most hookworm campaigns. The question of interest to the clinician is how to decide when second or further treatments should be given. The degree of recovery from the anæmia and of disappearance of the other signs and symptoms gives some guidance. Sufficient time must be allowed for recuperation before a decision is made by clinical features alone that serious infection is still present. As regards other indications a count of worms removed by the treatment and determination of their species are very useful and methods of forming a very rough estimate of the number of worms still harboured by a count of eggs in the fæces are also of some value.

These procedures are troublesome, however, and it will be enough to state here that treatment should usually be continued until eggs are absent or scarce

in the fæces when examined by the ordinary Willis salt flotation method.

The fæces should not be examined for ova too soon after an anthelmintic has been given, because, although worms may have survived, they may have ceased temporarily to lay eggs after their unpleasant experience. According to one investigation dealing with this point the examination may safely be made after four days or more in the case of carbon tetrachloride and most other drugs, but in the case of oil of chenopodium the worms take longer to recover and the examination should be deferred for at least twelve days.

When a second treatment is required it may be given a fortnight or less after the first, if that consisted of oil of chenopodium; with carbon tetrachloride it is better to wait longer, several weeks, to avoid all risk of cumulative action. In anchylostome infections more than two treatments may be needed. When the combined treatment with carbon tetrachloride and oil of chenopodium is used, more than one treatment will least often be required.

Ascaris Lumbricoides.

Probably the most efficient treatment for the common round worm of man is the well known one with santonin. Oil of chenopodium however (or "Ascaridol") is also very good and is the most desirable method when other worms as well as *Ascaris lumbricoides* (hookworms or tapeworms) may possibly be present; the mode of administration and the dose are the same as for hookworms.

Santonin is given in doses varying from 0·03 gramme (half a grain) for a young child up to 0·3 gramme (five grains) for an adult. The patient should be prepared by restriction of diet and a preliminary purge. The drug may be given together with castor oil or calomel and a further purgative must be given some hours later.

The following prescription may be used, of which one dose for each year of age is given every night for three nights.

> Santonin 0·01 gramme (one-sixth of a grain).
> Calomel 0·01 gramme (one-sixth of a grain).
> Sugar *quantum sufficit.*

Each dose is followed the next morning by a saline purge.

It is important to see that the purges act well, whatever drug is used for the treatment of *Ascaris lumbricoides.* Worms, poisoned but not killed, sometimes give rise to intestinal obstruction or other damage if not quickly removed, especially when many are present. Although ascaris infection often gives rise to no symptoms, it is credited with sometimes causing a variety of gastrointestinal or of nervous troubles. In spite of the variability and indefiniteness of such symptoms it seems beyond doubt that they are really caused by this and other worm infestations in some patients. Urticaria, of allergic nature, may occur.

The serious surgical complications which occasionally arise, are also well known; a great many have been reported and collected of recent years. Pulmonary symptoms may be caused in children, exposed to heavy infection by the larvæ in the course of their migration through the lungs.

Enterobius Vermicularis (*Oxyuris Vermicularis*).

Familiar as we are with the common thread worm, all stages of its life history have not yet been fully observed. The worms live in the caecum and upper part of the large intestine, but the gravid females emerge from the anus before discharging their eggs which the host when he scratches carries off with his finger nails to reinfect himself or infect another person who may swallow them.

Diagnosis is made from the symptoms and by finding the worms in the fæces after a suitable enema. It should not be attempted by the examination of a small fæcal sample for eggs, because these are laid for the most part outside the body and any present in the fæces are distributed quite unevenly.

It has been reported that microscopical examination for ova of the dirt under the finger nails of children is a fairly reliable means of diagnosis.

The therapeutic measures are well known, but cure may be very difficult, especially in adults. Measures to prevent reinfection are as important as those for the removal of the worms already present. Among the former are the wearing of strong cotton drawers and gloves at night, smearing the anus at night with a mercurial ointment and the paring of the finger nails and washing of the hands. The latter comprise vermifuges given by rectum or mouth. The adoption of strict diabetic diet is sometimes advisable.

Allusion may be made to *"Oxyuris incognita."* This was the name given to the unknown parent of certain large eggs which were found in human fæces in America and also by the Australian Hookworm Campaign. It has now been proved in America that these eggs do not proceed from any parasitic worm, but are swallowed with various vegetables which are eaten raw, such as radishes, celery and lettuce. At certain seasons these vegetables are often heavily parasitized by the widely distributed nematode worm *Heterodera radicicola,* the egg of which somewhat resembles a large oxyuris egg and contains a larva. These eggs pass unchanged through the gut of man and the eggs seen in the fæces contain still living larvæ. In Townsville radishes and carrots have been examined and in many of the roots the nodules formed by this worm were found abundantly and they contained numerous eggs which were found to be very resistant to digestive juices and to dilute mineral acids.

Trichuris Trichiura (*Trichocephalus Dispar*).

It is fortunate that infection with whip worms is not a serious matter, for no satisfactory means of removing them has been found. Some are often removed by oil of chenopodium given for hookworms.

Many weeks or even months outside the body may elapse before the embryo within the shell reaches a stage of development at which the egg is infective;

it can remain alive at this stage and infective for anyone who swallows it for as long as five years.

The infection rate with this worm shows a fairly close relation to the general sanitary standard.

Strongyloides Stercoralis (Strongyloides Intestinalis).

According to the findings of the Australian Hookworm Campaign *Strongyloides stercoralis* may be found occasionally in all the States of Australia.

The parasitic forms, parthenogenetic females, about 0·25 centimetre (a tenth of an inch) long, live usually in numbers in the submucous tissue of the small intestine. Infection is acquired in the same way as hookworm infection, by the penetration of the skin by larvæ in contaminated soil.

Diagnosis is made by finding the larvæ in the fæces; these have to be distinguished in the case of stale fæces from hookworm larvæ and from *Rhabditis hominis,* a free living worm which often contaminates fæces after they are passed, possibly through the agency of flies.

It is doubtful to what extent this infection is pathogenic. No satisfactory treatment is known, although oil of chenopodium is of some value.

Tapeworms (Cestodes).

The intestinal tapeworms are of less importance than the round worms. When they are met with, their treatment is often troublesome.

Three of the commoner tapeworms which inhabit man's intestine may be acquired in Australia, but none of them is very common. The three are *Hymenolepis nana, Tænia saginata* and *Tænia solium. Diphyllobothrim latum* (*Bothriocephalus latus*) is unlikely to be found in Australia except in immigrants from a country where raw fish is eaten such as Finland.

Hymenolepis Nana.

Hymenolepis nana is a very small tapeworm. It is the commonest tapeworm of man in warm climates in many parts of the world. It is the least rare of the intestinal tapeworms in Australia, where it is not confined to the tropical parts, although more often met with there. Of about two hundred thousand persons examined in Australia by the Hookworm Campaign this infection was found in 0·2%. Children are especially liable to be infected. The remarkable life history of this worm is of great interest. Certain questions concerning it have not yet been answered with certainty or at any rate with unanimity, for instance the question whether *Hymenolepis nana* of man and *Hymenolepis fraterna* of the rat are identical and whether man frequently acquires his infection from rats. There is little doubt, however, that the life history of the worm in man is the same as that of the rat tapeworm. This developes without any intermediate host, the larval (cysticercoid) stage occurring in the intestinal villi whence it is liberated into the lumen of the gut to become the adult worm. An important consequence of this mode of development is that autoinfection can occur and probably for this reason the number of worms present in an infected person may be large. Several hundreds are often present and there may be thousands. Infection is acquired by swallowing the eggs of the worm which occur in the fæces of infected persons (and possibly by swallowing the eggs from rat fæces).

As a rule there are no symptoms, but sometimes there are those of chronic intestinal catarrh. Various nervous symptoms have also been described as in so many other worm infestations.

Filix mas, the best drug against many tapeworms, expels this worm too, but seems to be inferior to oil of chenopodium or thymol. It is often difficult to remove all the worms.

The patient should be kept in bed during the treatment if possible and must be prepared by restriction of diet for one or two days followed by a purge on the afternoon of the day before the drug is given. Next morning oil of chenopodium should be given, divided into two or three doses and followed by a saline purge, the manner of administration and the dose being just the same as has already been described for hookworms.

After about three weeks the fæces should be examined for ova and the treatment repeated if they are present. The combination of oil of chenopodium with carbon tetrachloride as recommended for hookworms may also be tried.

As the ripe segments of this worm when they become detached are partly digested and the ova liberated, diagnosis can be made by examination of a small fæcal sample for eggs in the ordinary way used for most intestinal worms.

Tænia Solium and Tænia Saginata.

Tænia solium and *Tænia saginata* are both best treated by *Filix mas.* The same treatment should also be used for *Bothriocephalus latus.*

Tænia solium, acquired by eating infected pork incompletely cooked, is rather rare in Australia. If it is met with, the patient should always be thoroughly treated on account of the possibility of his becoming infected (by swallowing eggs passed by himself) with the larval form, *Cysticercus cellulosæ.* When this form invades man's tissues the brain is sometimes the organ involved.

Tænia saginata, acquired by eating insufficiently cooked beef infected with *Cysticercus bovis,* is also not common in Australia, but is commoner than *Tænia solium.* In the two hundred thousand persons examined in Australia by the Hookworm Campaign, only forty-two infections with one or other of these tapeworms were found. However the method of fæcal examination suitable for detecting hookworm eggs misses many cases of infestation with these tapeworms, because the ripe segments usually retain most of their eggs until they have emerged from the body.

Invasion of the tissues of man by the larval form, *Cysticercus bovis,* is very rare, more so than infection with *Cysticercus cellulosæ.* The removal of these tapeworms is not always easy and requires to be carried out with care and under properly controlled conditions. The patient must be confined to bed, preferably in a hospital. *Filix mas* is the most effective drug. It varies in quality and care should be taken to get a reliable preparation.

The ethereal extract, *extractum filicis liquidum*, is usually used; it should be freshly prepared. It is essential that the patient be carefully prepared by starvation and purging so as to empty the bowel completely.

The following are the details of procedure recommended by Lane and Low ("The Practice of Medicine in the Tropics," Byam and Archibald):

> Place the patient on liquid diet for two days. On the afternoon of the second day a dose of calomel or salts is given and some clear soup or milk in the evening. Next morning (the third day) a cup of black coffee may be taken and then three capsules, each containing thirty minims (two cubic centimetres) of the liquid extract are administered at intervals of half an hour, say at 9 a.m., 9.30 a.m., and 10 a.m. To prevent vomiting, one drachm of brandy, to which fifteen minims (one cubic centimetre) of chloroform have been added, may be given with the first dose. Two hours later a saline aperient (Epsom salts, Carlsbad salts or sodium sulphate) is administered, to purge the patient and wash out the worm.

Jalap may be used as the purgative instead of salts, but castor oil should not be given. A total dose of eight cubic centimetres (two drachms) should never be exceeded. Symptoms of poisoning consist in mild cases of jaundice; in more severe cases violent vomiting, abdominal pain, a feeling of feebleness, syncope, somnolence and occasionally amblyopia occur; in very severe cases cerebro-spinal paralysis and death result.

All stools should be kept and examined carefully to determine whether the head is present or not. The first motion should be passed into a vessel of warm water as this diminishes the likelihood of the worm breaking. It must be remembered that more than one worm, of either of these two species, may be present (*solium* is a misnomer). If the head survives, segments will reappear in the fæces in about two or three months. Should the head not be found in the stool following the dose of salts, an immediate dose of two cubic centimetres (thirty minims) of oil of turpentine in an emulsion or of a chloroform-eucalyptus mixture, may bring success. This mixture consists of eucalyptus two cubic centimetres (thirty minims), chloroform three cubic centimetres (forty-five minims), castor oil forty cubic centimetres (ten drachms). If the head is not found, a second treatment may be given after an interval of ten days. It is better, however, to wait three months and repeat the treatment only if segments reappear. *Extractum filicis liquidum* has a very horrible taste. For those who cannot take capsules, it may be administered in a mucilaginous emulsion such as *mistura amygdalæ*. The dose for children is from two to four cubic centimetres (half to one drachm).

Among other drugs which may be tried in special cases or when *Filix mas* fails, oil of chenopodium and thymol may be mentioned. Oil of chenopodium should be given in the same manner as for hookworms, but the preparation of the patient by starvation and purging should be carried out in full just as with *Filix mas*. Carbon tetrachloride is said to anæsthetize the worms temporarily and must be immediately followed by a massive saline aperient to remove them. A mixture of carbon tetrachloride and oil of chenopodium as recommended for hookworms is worth trying when *Filix mas* fails; it is less nauseous and quite safe.

RADIOTHERAPY AS AN AID TO OTO-RHINO-LARYNGOLOGY.[1]

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TONIGHT I propose to put before you the present state of the art of radiography as an aid to the diagnosis of conditions met with in your practice as specialists in ear, nose and throat surgery.

A specialist has been described as "one who knows everything about his own subject and nothing about anything else." Perhaps, if you will accept this definition, you will forgive me for the very little I know about your speciality.

Now skiagrams are but shadow pictures; when X rays pass through a region, we have reproduced on the film a record of the densities of the various structures through which they pass. Ordinary bone stops a great number of X rays while the air-filled spaces of the face allow a greater number to pass and thus produce greater photographic effects on the sensitized film. If one of these spaces is filled by an effusion of fairly high specific gravity, a great number of the traversing X rays fail to reach the film; therefore we have a light area on the negative where we would expect a dark one and so we are able to demonstrate departures from the normal and draw various conclusions.

The first essential in radiographic work is a good negative. With modern machinery and technique this should be insisted upon. Distortion must be avoided in sinus skiagrams, especially as we are dependent in this class of work almost entirely on our ability to compare the two sides and note variations in their density.

The X ray examination should be looked upon as an additional clinical method and should be considered in conjunction with the other signs present and should never be looked upon as a short cut to diagnosis.

Usual routine examinations should be made and then the patient should be referred to the radiologist for confirmation of the findings or possibly for the demonstration of some unsuspected abnormality.

In reporting on skiagrams, the radiologist should state what variations he notes from the normal and what variations in translucency are noticeable on comparison of the two sides. Then and only then should he give his interpretation stating what pathological conditions would give these radiographic

[1] Read at a meeting of the Section of Oto-Rhino-Laryngology of the New South Wales Branch of the British Medical Association on November 30, 1925.

appearances. Perhaps, as in the American special clinics, greater liberty may be allowed where surgeon and radiologist are constantly working together; but it is not good practice for a radiologist to advise as to operation or to suggest treatment.

We will now pass on to consider various regional lesions as met with in an average practice.

Anterior Head Sinuses.

The best position for radiography is with the patient lying prone, with the chin resting on the table and the nose elevated about 1·25 centimetre (half an inch) above the chin level. The central ray passes through the vertex, striking the film at right angles. Upper dental plates should be removed before examination, otherwise the floor of the antrum will be obscured. The actual exposure possibly does not interest you, but we use ten milliampères of current at a 13·75 centimetres (five and a half inches) gap for ten seconds using the Potter Bucky diaphragm, duplitized films and double intensifying screens. This picture will include both frontal and ethmoidal sinuses and both antra. The picture on the screen shows the correct position with the antra and the frontal sinuses well displayed (each slightly enlarged in the skiagram) and the ethmoid cells are seen to either side of the nasal cavity. If the tube is centred too far back or if the nose is lowered to the chin level we get obliteration of the antral shadows by the massive petrous temporal bones. Deviations of the septum and enlargement of the turbinate bones can also be demonstrated, but as such lesions are demonstrable by your ordinary examination, it is rarely commented upon by the radiologist.

An effusion into any of these air spaces causes absorption of the X rays and consequently less light effect on the film, giving a lighter area on the affected side which we call a comparative dulness. Now this dulness may be due to pus, to polypoid material, to thickened membrane, new growth or to a simple inflammatory effusion; the latter is common in influenzal infection and if an examination is made after a week or ten days, in many cases it will have disappeared.

A peculiar rounded shadow is frequently seen projecting above the antral floor. This gives dulness to ordinary transillumination and is due to the presence of a mucous cyst and it would be missed in an ordinary antral puncture through the nose. Simple bone cysts and dentigerous cysts in the maxilla are frequent sources of pain similar to antral pain. They are benign and evacuation with curettage leads to cure. The upper premolar and molar alveolar processes should always be examined in antral cases, as unsuspected periapical foci are frequently found in these regions. The skiagrams I show you demonstrate how closely dental structures are related to the antral floor.

The frontal sinuses vary greatly in size, shape and position and frequently the septum is to one side of the mid line. I will show you examples of frontal abnormalities and of the appearances seen in disease. We must always remember that frontal sinuses are rarely demonstrable before eight years of age while absence of one frontal sinus is by no means uncommon.

When the inflammatory conditions in these sinuses extend to the bone, they produce a haziness and loss of bone detail as is usual in osteomyelitis generally.

Ethmoidal cells are difficult problems and unless a very definite unilateral infection exists, it is rarely possible to state whether disease is present or absent.

Sphenoidal cells are radiographed with the plate under the chin and the central ray passing vertically downwards in a plane about 2·5 centimetres (one inch) anterior to the external auditory meatus and casting the shadow of these cells in the horseshoe loop of the mandible. Deviation of the medium septum may be demonstrated and frequently dulness of the air cells. A method of localizing the various cells which is often of great help is to pass a probe into what is considered any particular set of cells and then skiagraphing the part; it is surprising how often the specialist is at fault in his estimation of distances when working among these cell spaces.

Mastoids.

The generally adopted position for radiography of the mastoid cells is to place the patient prone with the head turned to the side, with cheek and ear resting on the film (the pinna being turned forward)and with the mastoid process centred over the middle of the film. The central rays are then directed to the centre of the film through a point five centimetres (two inches) above and five centimetres behind the external auditory meatus the tube being tilted 10° downwards and 10° forwards. The mastoid cells manifest no cellular development before three years of age and usually not until the fifth year and so mastoid examination of patients under five years of age is unsatisfactory.

Two types of mastoid cell are recognizable: (i.) the noncellular and (ii.) the pneumatic or cellular types. The first type is practically indistinguishable from sclerosed conditions, but a bilateral skiagram will allow of a differentiation as the two mastoids are generally symmetrical. In the pneumatic type the cells are distinctly visible and the fine cellular and trabeculated structure can be seen.

The most important finding is a loss of definition in trabeculation meaning that an inflammatory exudate is present or if the loss of definition is very great, that there is destruction of bone substance with breaking down of the cell walls. Necrotic bone shows as a darker shadow in the skiagram owing to the greater translucency of necrotic areas. Necrosis, cholesteatoma and bone cysts all give similar radiographic appearances, that is the appearances of bone absorption. Mastoids with large antral cells allow of better drainage than the small celled type and such mastoids are more likely to improve without operation. Mastoids which do not heal after operation will often be found to manifest

cell structure still present or even sequestra and in these cases further operation is indicated. I do not think that the radiologist can go further than this.

Other Causes of Anterior Headache.

Pituitary tumours are frequent causes of headache and may be diagnosed from the distortion or destruction of the *sella turcica*. Great care is necessary in examining the sella region as the slightest distortion will mean wrong interpretation. I show you an example of great enlargement of the *sella turcica* and one of destruction of the sella. Another interesting head skiagram shows that rare condition of ossification of the *falx cerebri*; the patient suffered from intense frontal headache.

I will now pass on to some other regions in which you are interested.

Salivary Calculus.

Salivary calculus can nearly always be demonstrated when present.

Œsophagus.

Foreign bodies in the œsophagus vary in size and shape and tend to catch at the level of the sixth cervical vertebra. Coins and metallic tooth plates are easy of detection, but such foreign bodies as small chop or fowl bones are extremely difficult to demonstrate while fish bones, unless extremely stout, cannot be demonstrated at all. Shadows of the hyoid bone and calcification of the laryngeal cartilages are most confusing. These foreign body cases call for close cooperation between the throat surgeon and the radiologist. The safest course is for the throat surgeon to examine these regions down to the arytenoid cartilages or possibly a little lower by ordinary mirror examination. Then skiagrams should be taken of the cervical and dorsal regions and if no foreign body is found a bolus of barium sulphate suspension or better a bolus of cotton wool and barium sulphate is given. In many cases the barium will be held up at the level of the foreign body and if the foreign body is jagged, the cotton wool bolus is very likely to adhere to it. If, still, the radiographic examination reveals no foreign body and the symptoms persist, a complete œsophagoscopy is indicated.

Other types of œsophageal obstruction are readily demonstrated by means of the opaque bolus.

Normally there is a hesitation in deglutition at the level of the aortic arch and the meal may be seen to pass round this. Aneurysm is very easily demonstrated and of course should be excluded before instrumentation is undertaken. Simple strictures of the œsophagus in our experience are very rare and practically the only cases we see are due to cardiospasm, examples of which I show you. While in Boston I saw many drawings by artists of the œsophagoscopic appearances seen in cardiospasm and in each case cicatricial bands were demonstrated and it was held there that every cardiospasm is associated with some cicatricial lesion at the lower end of the œsophagus.

There is a peculiar form of œsophageal or rather pharyngeal obstruction which is really due to some incoordination in action of the pharyngeal constrictors. The patient tries to swallow but very little passes down, while regurgitation into the larynx with coughing occurs. This condition is practically always due to ulceration of the larynx or upper pharynx and such ulcer should be carefully sought; in most cases it is extremely small.

Malignant strictures are fairly common and there is seen an obstruction with dilatation above the stricture, while a ragged stream of barium suspension passes downwards through the affected area. Œsophageal pouches fill with barium sulphate emulsion and contain opaque material for many hours after a bolus has been swallowed.

Larynx, Trachea and Lungs.

Foreign bodies which pass the vocal cords, usually pass into the right bronchus.

Foreign bodies in the larynx are diagnosable by ordinary laryngoscopic methods. Opaque foreign bodies are demonstrable in skiagrams and cause little difficulty in localization. Nonopaque foreign bodies, however, present great difficulty. Usually soon after the foreign body becomes impacted we have an emphysema on the affected side followed later by congestion and diminished translucency of the area served by the blocked bronchus. At a still later stage we have probably abscess formation.

Tuberculous ulceration of the larynx is practically always associated with pulmonary tuberculosis and extremely early stages of tuberculosis are recognizable radiographically and often times such lesions are demonstrable months before any clinical signs are present. I do not intend to go into the matter of the diagnosis of pulmonary tuberculosis, but will show you a couple of slides demonstrating lesions which were not recognizable clinically, although advanced pathological changes were present.

Conclusion.

And now before closing I would refer to two radiotherapeutic measures which have proved of value in your specialty.

Firstly.—The death rate from *status lymphaticus* in simple tonsillectomy in some of the large Boston clinics was rather alarming (seven or eight *per annum*). It was decided to examine radiographically the chests of all children before operation and any showing enlargement of the thymus were given one or two medium intensity radiotherapeutic doses over the thymus and operation was deferred for a month. After the adoption of this method the death rate disappeared and in over a year there had been no deaths from this cause after tonsillectomy in children.

Secondly.—In regard to the radiation treatment of enlargement of the tonsils, I have little to say. It is an accepted method of treatment and is of great value in cases in which operation is contraindicated, for example cardiac or renal disease,

hæmophilia *et cetera*. Three applications over each tonsillar area spread out over four weeks should cause definite shrinkage of the lymphoid tissue. The dosage used at each sitting to each tonsil is four milliampères at 17·5 centimetres (seven inches) gap, 30 centimetres (twelve inches) distance, with a one millimetre aluminium filter for four minutes. Deep crypts should be cauterized before radiotherapy.

EXPERIMENTAL RADICAL MASTOIDECTOMY.

By ERIC W. GUTTERIDGE, M.D. (Melbourne),
Honorary Aural Surgeon to the Children's Hospital, Melbourne.

THE classical radical mastoid operation with or without skin-flaps or graft has certain disadvantages in greater or less degree.

The completely epithelialized cavity has a constant desquamation of the epithelium lining the large middle ear-mastoid cavity. The amount varies as the square surface and possibly thickness of epidermis.

The divided posterior meatal wall is plastered back on the roof and floor of the mastoid cavity and the ceruminous glands continue to secrete.

These factors together lead to the formation of accumulations and cause more or less discomfort and headache and, if neglected, the accumulations become infected and offensive.

The wide open meatal orifice permits the entrance of fluids and dust. Loss of the protective cerumen and meatal hairs is the cause.

In those cases in which epithelialization has not been achieved for a variety of reasons, the ceruminous and epithelial masses are macerated by the consequent discharge, forming a moist, sodden and infected aggregate and tending to inflame and destroy the epithelial lining.

It therefore appears that it is the presence of the postaural cavity which brings in its train these particular disabilities and that if means could be devised to obliterate this cavity, the ultimate condition of the patient would be improved. Furthermore the restoration of the meatus to its prior condition would conserve those protective functions of the cerumen and meatal palisade.

In the September issue of *The Edinburgh Journal of Laryngology* there is a report of a visit by some English aurists to Brussels. In the discussion on the method of Bárány and two operations done by Dr. Buys, of that city, appears the following sentence:

> The object of the method is to avoid those accumulations of epithelium, wax and pus which form in the antrum and aditus after a meatal flap has been cut according to the methods of Korner, Panse and others.

The following methods have been reported:

(i.) By author unknown told me by Dr. Ewing: the periosteum of the reflected skin flap is dissected and fashioned to form a sort of partition between the external auditory meatus and the mastoid cavity. Granulations are encouraged to grow in the mastoid and fill the space.

(ii.) The method of Bárány; the operation consists in the removal of the bony meatus and the outer attic wall, leaving untouched the cartilaginous meatus. At the end of the operation the mastoid wound is sutured with the exception of the lower end in which a rubber drain is placed.

I am showing patients to exemplify two further methods of operations on the same principle.

1. The use of scar tissue. It is assumed, as in the Schwartze operation, that the mastoid bone cavity with appropriate treatment can be completely filled with granulation tissue and that this tissue will ultimately be replaced by scar tissue. In the second place it is assumed that the limitation of the spread of granulation tissue is by the ingrowth of epithelium across its surface. It follows that if means can be devised to prevent the ingrowth of epithelium over the granulating cavity, the result would be that these granulations would completely fill the cavity. It is necessary, therefore, to maintain the advancing wall of granulations without pocketing, to destroy the advancing line of epithelium one cell thick by caustics, such as tri-chlor-acetic acid, a superficial painful escharotic, or solid silver nitrate, a powerful, painful escharotic, or a 40% solution of silver nitrate, an efficient and less painful escharotic.

The operation proceeds as in the classical radical mastoid operation with the following modifications.

The facial spur may be lowered sufficiently to obtain a good access to the middle ear. There is no necessity to lower the spur laterally to a considerable extent, as the floor of the mastoid cavity will soon fill up with granulations.

The cartilaginous wall of the external auditory meatus is incised at the level with the facial ridge. The large upper segment will be pressed against the superior wall of the mastoid cavity by the gauze packing and will thus not interfere with the view of the space.

To increase the size of the external orifice of the external auditory meatus a crescentic piece of cartilage is removed around this opening. This gives a more complete and extensive view of the cavity.

The cavity is treated in the usual manner with alcohol and bismuth-iodoform-paraffin paste. No flaps are cut or skin graft inserted. Iodoform gauze is firmly packed into the meato-antral cavity with its tail protruding from the meatal orifice. The postaural wound is sutured.

After treatment: On the fourth day the packing is removed and reinserted through the meatus with firmness in the aditus groove and external auditory meatus orifice, loosely elsewhere.

Exuberant granulations are destroyed with a 40% solution of silver nitrate or gently checked with the 4% solution.

At each dressing the lines of spreading epithelium are destroyed by painting with tri-chlor-acetic acid or the 40% solution of silver nitrate. These lines will be from the cut edges of the skin lining the external auditory meatus and the conchal orifice.

This dressing is repeated every second or third day. In from six weeks to two months the granulation wall has advanced to the line of the facial ridge and pushes down before it the superior segment of the meatus wall. Applications of the 4% solution of silver nitrate will retard the granulations and permit the edges of the meatal wall to rejoin or epithelialize over any bare areas.

There is thus a completely reconstituted meatus.

Skin grafting will be necessary to epithelialize the labyrinthine wall and to assist in sealing off the tubal orifice.

The subsequent course of the granulation tissue in the mastoid antrum is a metamorphosis into scar tissue with contraction of the mass. This contraction after the lapse of some months is of a considerable amount and dilates the meatus into a wide, open, fusiform space. However forward the granulation wall is taken, this will occur and forms a defect of the operation. It has not, however, led to any accumulation of *débris* and the like, possibly from the main dilatation being away from the aditus and labyrinthine region.

This method is also suitable for modified radical mastoid operations in which the *membranum tympani* is left *in situ* and the ossicles are undisturbed.

There appeared to be no reason why other material should not be used to obliterate this unwelcome space, such as fat, fascia as from the *fascia lata* bone, either in the form of fragments from the operation or as grafts from the tibia, cartilage from a rib.

2. Muscle graft, a pedicled flap implant. While contemplating this method I came across a plan of Gillies, of Sidcup Face Hospital, for building up the malar prominence in war injuries by such a graft taken from the temporal muscle.

The temporal muscle was not sufficiently bulky for this problem, but the sterno-mastoid muscle is of suitable mass and being attached to the mastoid process, is suitably situated. Removal of the whole muscle leads to no ill effects (Maitland).

The urgent necessity is to maintain or secure asepsis or a minimal infectivity to obtain primary union of the graft and bone. To this end "Acriflavine," an inhibitor of bacterial growth, was used in a strength of 1 in 1,000 in paraffin oil.

The operation proceeds normally with the removal of the necessary bone and curettage of the middle ear and the auditory tube *et cetera*. The lower edge of the mastoid cavity is sloped off downwards. In conjunction with Mr. John Tait, who kindly assisted me with this series, the sterno-mastoid was exposed, split along its length twelve and a half millimetres (a quarter of an inch) from the anterior border for a sufficient distance, cut across and the reflected mass modelled to fill rather tightly the mastoid space.

A skin graft was cut from the leg and inserted into the external auditory meatus against the labyrinthine wall to cover over the bony areas and the hiatus between the cartilaginous meatus and the medial wall, representing the depth of the middle ear. A firm plug of gauze soaked in the "Acriflavine" was placed against the graft. Similarly a small drain was placed to the aditus, emerging through the lowest corner of the wound. The neck wound was also drained. The incision was sutured.

The posterior drains were removed in two days. The meatal plug was reinserted in eight days and then every four or five days. So efficient is the inhibitory action of the "Acriflavine" that it is possible to continue this plugging until epithelialization has been completed. There was in each patient operated on a considerable contraction of bulk of the muscle grafts. It was estimated that this would amount to a third of the mass. In the cases to date this contraction has merely depressed the postmeatal area.

The labyrinthine wall has epithelialized in about two months and all discharge ceased.

Three patients have undergone this operation. Each appears to have been successful at present at least. Their subsequent history will be of interest.

THE PRINCIPLE OF INTRATRACHEAL ANÆSTHESIA.

By A. B. K. WATKINS, M.S. (Lond.), F.R.C.S. (Eng.),
Honorary Surgeon to Ear, Nose and Throat Department, Newcastle General Hospital, New South Wales.

THERE exists at present a very wide misconception of the nature of intratracheal anæsthesia. This no doubt has arisen largely from the fact that anæsthetics have been given by the intraoral, intrapharyngeal or intranasal routes more frequently than by the intratracheal and usually with the same apparatus.

Now the principles of intratracheal anæsthesia differ so widely from those of any other and the importance of their being adequately grasped is so great that no excuse for emphasizing them need be made.

When anæsthetic vapours are delivered into the air or common alimentary and air passages above the glottis, as long as an efficient airway is maintained, it is absolutely immaterial what volume of vapour is fed to the patient as long as he receives sufficient ether or chloroform as the case may be. The method does not claim to keep blood or pus from being inspired into the lower air passages and any efforts in this direction must be made by the not invulnerable methods of swabbing, suction and hæmostatic clamps.

Now the chief use of intratracheal anæsthesia is to keep the lower air passages free from blood or pus while one is operating on the upper. Apart from laryngotomy or tracheotomy and plugging the pharynx, it is the only method we have which, when

properly used, is an absolute guarantee against inspiration of fluids.

Intratracheal anæsthesia is used for other purposes also. As is now well recognized, lung surgery can be satisfactorily performed without differential pressure anæsthesia. However, if pleural infection is present, it is less likely to spread if the operation is performed under circumstances which allow the intrapulmonary pressure to exceed the extrathoracic pressure and which therefore do not allow the visceral and parietal layers of the pleura to separate. This is most easily obtained by intratracheal anæsthesia.

For other conditions besides those mentioned intratracheal anæsthesia is unnecessary. Just as good results can be obtained without introducing foreign bodies into the trachea, if a Hewitt's or other airway be used and the anæsthetic vapour be passed into the air passage over the glottis. There is one exception. When the patient lies on his face with his neck flexed (as for suboccipital decompression *et cetera*) intratracheal anæsthesia should be used, for in practice it is found that the airway is particularly liable to be obstructed by the extreme flexion of the neck.

It will be seen that it is in operations in the mouth, nose or pharynx that intratracheal anæsthesia is of paramount importance. Immunity from the risk of aspiration can be obtained only by attention to one essential principle. It is this. The volume of air supplied (irrespective of what amount of anæsthetic it may contain) must be so great that, even while the patient is inspiring, there is an excess ascending between the catheter and the walls of the trachea. This excess must be sufficient to prevent the descent of fluids.

Now with nearly every intratracheal apparatus this can be obtained with certainty only by passing an enormous excess of air down the catheter and this is to be deprecated, for the anæsthetist in his attempts to prevent there being a tornado in the trachea may be led to diminish the stream too much and allow fluid to be aspirated.

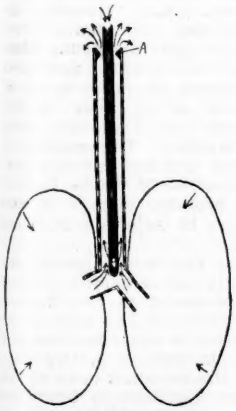

FIGURE I.
Air supplied through catheter during expiration.

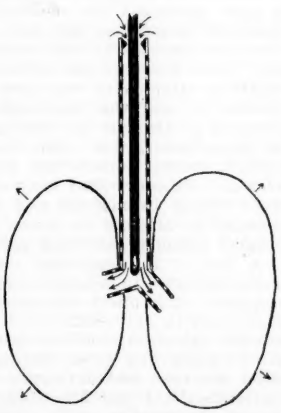

FIGURE II.
No air supplied through catheter during inspiration.

In practice it has been found that the least upward stream alongside the catheter during inspiration is sufficient to keep fluids from descending and this allows one to determine if sufficient air is being supplied from the apparatus.

Figure I. represents what happens during expiration. At *A* there is slight obstruction to respiration caused by the air passages being narrowed by the vocal cords and aryepiglottidean folds. During expiration the tidal air from the lungs and all the air being supplied by the apparatus will be passing up alongside the catheter and the air pressure in the catheter will reach its maximum. Owing to the large draught of expired air no blood can descend.

Figure II. represents the condition when no air is being supplied by the apparatus during inspiration. Here blood will be inspired while the slight obstruction caused by the cords will cause the pressure in the catheter to become negative. This, of course, will occur in a similar way though to a less degree when there is a supply of air through the catheter less than that being inspired by the lungs. As soon, however, as more air is being supplied by the apparatus than the patient can inspire, although the pressure in the catheter will fall, it will not fall below the atmospheric pressure. This supplies the key to the situation, that as long as there is a positive pressure in the catheter at every phase of respiration, no fluid will be inspired from the upper passages.

Nearly every intratracheal anæsthetic apparatus is supplied with a mercury manometer. However, the inertia of the mercury is so great that negative pressures can exist for short times in the catheter without being indicated by the manometer. Further the manometer is not always situated at the patient's end of the intratracheal apparatus as it should be if small negative pressures existing for short space of time are to be indicated.

The most useful type of negative pressure indicator to use is a rubber covered tambour. If this be connected to the patient's side of the apparatus, as long as the rubber covering remains distended one need have no fear that the patient is not receiving enough air. The least retraction during any phase of respiration indicates that a risk of inspiration of fluids exists and more air must be supplied.

Elliott Brothers have made a tambour to my design. It is shown in Figure III. and will convert

FIGURE III.

any intratracheal apparatus designed without a negative pressure indicator into one just as useful and easy to use as if it had been. It consists of a shallow circular metal tray fifty-eight millimetres in diameter covered with a double layer of thin

rubber. Under the drum are two horizontal tubes. One of these communicates with the lumen of the drum and one end of this tube is put in the circuit of the intratracheal anæsthetic apparatus between the apparatus and the patient. The other tube has no holes in its side and is simply included with the tambour so that it is always at hand if required. It is of use should the rubber become torn or perforated during an operation, when the tambour can be excluded and the circuit restored by changing over both rubber tubes from one metal tube to the other. Under the apparatus is a pedestal and screw by which it can be fixed where required.

When a tambour is used, the anæsthetic is conducted as follows. The patient is deeply anæsthetized as usual, the catheter is introduced into the trachea and connected with the apparatus. The pumps are adjusted to supply a moderate volume of air, the mercury blow off having been adjusted to prevent a pressure in excess of twenty-five millimetres of mercury for ordinary work and thirty millimetres for intrathoracic procedures. The tambour is now observed. If the rubber diaphragm is being indrawn during inspiration, not enough air is being supplied and the pumps must be regulated to supply more. If the drum remains distended and does not move at all with respiration this is a sure sign of obstruction to the air flow. If such obstruction is not produced by kinking of the rubber tube going to the patient, it will be due to a blocked catheter. In adjusting the pumps it is well to give sufficient air to keep the rubber distended so that its centre is at least three millimetres above the periphery; this allows a safe margin.

When tested against a manometer it is found that one millimetre negative pressure of mercury makes a considerable retraction of the diaphragm of the tambour.

In conclusion I wish again to emphasize the importance of realizing the basic principle of intratracheal anæsthesia, namely that in order to render the anæsthetic so safe that the patient can go on breathing quietly and evenly and keep fit and have a good colour and be so immune from the dangers of inspiration that the nasal, pharyngeal and oral cavities may be completely filled with blood, pus or lotions without any danger, enough air must be supplied for there to be an excess of it passing up alongside the catheter towards the mouth during every phase of the respiratory act.

Reports of Cases.

RUPTURE OF THE BOWEL FROM AN INJURY TO THE GROIN.

By STUART GIBSON, M.C., M.B., Ch.B. (Melbourne),
Hobart, Tasmania.

THIS case is reported for its interesting and unusual features.

W.B., a male, aged fifty-six years, was seen at 11.30 p.m. on April 18, 1926. His history was as follows: At three o'clock in the afternoon while pushing a truck laden with about eight cases of apples along the ground, the truck caught in a root, bounced back and hit the patient in the left groin with a wooden cross-piece. The blow caused intense pain followed by vomiting. After lying down on the ground for ten minutes or so he walked in comparative comfort for two and a half miles to catch a steamer back to town. He did not feel unwell and it was only after a great deal of persuasion that he consented to have medical advice. When seen, he was lying comfortably in bed, the only thing obvious being a slight increase in his respiratory rate. The temperature was normal and the pulse rate seventy-eight in the minute. On examination his tongue was normal, he had slight tenderness over the gall bladder region, none elsewhere in the abdomen. He had a large left sided varicocele, a bruise where he had received the blow over the left inguinal canal and here there was also much tenderness. No history of hernia was obtained, in fact the patient was quite sure he had never had a hernia. The inguinal region was too tender to allow the presence or absence of a bubonocele to be determined. Nevertheless he was admitted to hospital and his temperature and pulse charted every hour. About 3 a.m. he developed some severe abdominal pain, generalized, his temperature gradually rose to 37·8° C. (100° F.) and his pulse rate to 120 by 8 a.m. He had a foul tongue and slight abdominal distension.

The abdomen was opened through a mid-line incision. A large amount of sero-purulent fluid escaped through the peritoneal incision. A small jagged puncture was found in the ileum through which fæcal matter escaped freely, the finger could be easily passed down the full length of the left inguinal canal, demonstrating the presence of an unsuspected hernia. The rent in the bowel was repaired, but needless to say the patient died twelve hours after operation.

The exertion of pushing a heavy truck had forced a portion of gut into the inguinal canal, the blow rupturing it.

The interesting features are the unusual sequelæ of an injury in the groin and the length of time before any definite peritoneal symptoms developed, about twelve hours.

WHOLE BLOOD FROM A CONVALESCENT PATIENT USED IN PROPHYLAXIS OF MEASLES.

By JEAN MACNAMARA, M.D. (Melbourne),
Melbourne.

Clinical History.

A MALE patient, aged four years, had suffered from recurring convulsions since November, 1923. The interval between attacks had gradually diminished until in July, 1925, convulsions recurred at half hourly intervals over a period of ten days. After an interval of slight improvement during August another succession of convulsions occurred and his general condition was so debilitated that a poor prognosis for recovery was given. However, he gradually improved, but was still pale and atonic, when his sister, aged six, with whom he spent the hours when she was home from *Kindergarten* school, developed measles. Her fever was first noticed on the evening of October 3 and the rash appeared on the body on the evening of October 6. During this period she had been in close association with her brother. The mother, a trained nurse, stated that he had not had measles previously. In order that his progress should not be further handicapped by measles and the probable sequelæ, it was decided to attempt to protect him by injection of blood from a recently recovered person.

A boy, C.J., aged nine years, had been treated for severe measles in August, 1925. He had recovered without sequelæ. His blood had been submitted to the Wassermann test in July, 1925. It had been tested as part of the routine examination of the institution to which he belonged. No reaction had been obtained. On October 8, two days after the rash had developed on the face and body of the patient's sister and five days after her onset of fever and coryza, twenty-five cubic centimetres of C.J.'s blood with two cubic centimetres of 4% sodium citrate solution were injected in two injections in the subscapular tissues.

During the four days following the patient was drowsy and resented handling. The temperature did not rise above 37·2° C. (99° F.).

On October 19 the measles rash appeared on several class mates of the patient's sister, but the little boy escaped.

Comment.

It is considered that this case history may be worth recording. It is not claimed that any conclusion can be based on an isolated case, but it will serve to direct attention to the results obtained by Zingher, Kutter and Adler, by whom serum or whole blood of convalescents has been used for prophylactic inoculation of contacts. Zingher reports that convalescent serum, plasma or whole blood has definite value in conferring complete passive immunity, if injected within the first four or five days after exposure. When administered later, the disease is modified. Of one hundred and two non-immune children injected after exposure to measles for varying periods of time, ninety-two were protected, seven developed modified measles and two typical measles. Of the two one was injected before the fifth day, one later. Kutter found that in twenty-eight of two hundred and twenty-five children injected the inoculation was unsuccessful, usually because given too late after exposure. It was found that protection did not continue after three to four months. Until some quantity of convalescent serum is prepared by methods similar to those at present used in Melbourne for anti-poliomyelitis serum, the ease of inoculation of whole blood with its promise of passive protection, lasting until the danger of infection has passed for that season, suggests a field of usefulness, particularly in young children during the winter, when the secondary coccal invasion produces such grave and far reaching consequences.

Acknowledgment.

I am indebted to Dr. T. Garnet Leary for permission to publish the report of this case.

Bibliography.

A. Zingher: "Convalescent Whole Blood, Plasma and Serum in Prophylaxis of Measles," *The Journal of the American Medical Association*, April 12, 1924, page 1180.

P. Kutter: "*Weitere Erfahrungen mit Masernrekonvaleszentenserum*," *Zeitschrift für Kinderheilkunde*, Vol. XXXVI., page 119, quoted in "The Practical Medicine Series."

ACUTE TORSION OF THE SPERMATIC CORD, ASSOCIATED WITH CONGENITAL INGUINAL HERNIA IN AN INFANT.

By REG. E. NOWLAND, M.C., M.B. (Sydney),
Wyong, New South Wales.

S.W., aged nine days, a healthy baby, weighed four kilograms (nine pounds) at birth. He suffered from phimosis. The parents objected to circumcision, so an attempt was made to dilate the prepuce, but not with much result. The infant passed urine, but with slight discomfort, otherwise there was nothing abnormal for the first eight days and no evidence of hernia was present. About 8 a.m. on the ninth day the infant started to whine and cry; it kept this up till about 10.30, then cried strenuously and kept it up till I saw it about three hours later. It was then obviously in a lot of pain, had not vomited, crying spasmodically, the thighs were flexed on the abdomen and the abdominal wall was fixed and distended.

There was a tense painful sausage-shaped swelling about 3·75 centimetres (one and a half inches) long and 1·25 centimetres (half an inch) in diameter in the right inguinal canal, the right testicle could not be isolated. I induced a light anæsthesia to make a more complete examination. As the infant was very restless, nothing more than the above features could be made out; the swelling could not be reduced.

On making an incision over the swelling in the line of the inguinal canal I found a bluish-black mass presenting at the wound. It was very tense and at the lower pole of this mass was a gangrenous-like patch. On incision of the sac of this swelling, about eight cubic centimetres (two fluid drachms) of dark yellowish fluid escaped and the gangrenous patch referred to was seen to be the testicle. The cord was found to be twisted, this was loosened, but the testicle appeared to be destroyed and was removed. There was a small knuckle of bowel lying free in the sac; this was easily reduced, there being no constriction. The redundant part of the sac was dealt with in the usual way. The wound was closed in layers. The prepuce was fully dilated. Recovery was uneventful.

I thought this case worth reporting:

1. Because of the comparative rarity of torsion of the spermatic cord in such a young infant.
2. Because of the extensive degree of gangrene that had taken place in the testicle in such a short time.
3. Because being associated with phimosis, the catastrophe may have eventuated from the slight difficulty the child had at micturition, there being a certain amount of straining at the act.

Reviews.

GUY'S HOSPITAL REPORTS.

THE January number of *Guy's Hospital Reports* has come to hand. The articles in this number constitute a valuable series. Sir Thomas Hale White contributes an interesting account of the life of the late Golding Bird, sometime assistant physician to Guy's Hospital. Dr. J. A. Ryle reports five cases of erythræmia and adds a note on treatment of the condition with phenylhydrazine hydrochloride.

Dr. W. Gordon Sears writes at some length about congenital cystic disease of the kidney, liver and pancreas. Dr. Sears holds that sufficient stress has not been laid on the congenital and hereditary nature of the disease. He finds it necessary to postulate some definite defect in the germ plasm of the individual or of his ancestors capable of transmission to successors.

The question of apnœa, dyspnœa and cyanosis in relation to anæsthesia is dealt with by Dr. M. S. Pembrey and Dr. F. E. Shipway. The former discusses the subject from the physiological aspect and the latter from the point of view of anæsthesia.

Dr. A. J. Kohiyar investigates the results obtained by Dr. J. R. Bell in four hundred and twenty-five fractional test meals and by Dr. A. F. Hurst in six hundred and fifty-five similar analyses.

A series of highly instructive reports of cases are included; explanatory notes and comments are added by members of the staff. This is a method of teaching of great value and might with advantage be adopted more frequently in Australia.

Apparently lay radiologists are still tolerated in other parts of the world. Mr. P. J. Briggs, radiologist to the New Lodge Clinic, contributes an article on the radiological examination of the pelvic caecum and appendix. He discusses inflation of the rectum and colon, distension of the bladder and bimanual manipulation.

Surgeons will read with interest an account of treatment of myeloma of the radius treated by curettage and autogenous cancellous grafting.

An article by Mr. J. Lewin Payne, dental surgeon to Guy's Hospital, on dental education in the United States and Canada, completes the issue.

A YEAR'S PROGRESS IN THERAPEUTICS.

THE volume on general therapeutics, of the "Practical Medicine Series," edited by Bernard Fantus, is to hand.[1] It contains a mass of information on therapeutic measures,

[1] "The Practical Medicine Series, Comprising Eight Volumes on the Year's Progress in Medicine and Surgery: Under the General Editorial Charge of Charles L. Mix, A.M., M.D.; Volume VI.: General Therapeutics; 1925. Chicago: The Year Book Publishers. Crown 8vo., pp. 392. Price: $2.25 net.

culled from the medical literature of the world during 1925. Nothing of any importance seems to have been omitted and all the progress of the year has been carefully and methodically set out. The volume begins with the new United States' Pharmacopœia. Here we see the deletion of many drugs and preparations, an example the British Pharmacopœia might with great advantage follow. Amongst the host of subjects dealt with may be mentioned the following: intraperitoneal injection of drugs, duodenal drainage of the gall bladder, the value of which is questioned, chlorine inhalations for naso-pharyngeal catarrh and other disorders of the respiratory tract, but not for hay fever, asthma, pneumonia or tuberculosis.

"Mercurochrome 220" in the treatment of septicæmia (especially staphylococcal) is fully dealt with; acute nephritis is a contraindication. The excellent results obtained by "Tryparsamide" treatment for neuro-syphilis are mentioned. It is, however, useless for the gastric crises and lightning pains of *tabes dorsalis*. The oral administration of "Stovarsol" has had good results in syphilis, yaws and other spirillary diseases, as well as amœbiasis. The bismuth treatment of syphilis compares favourably with that by "Arsenobenzol" and is superior to mercurial treatment. The literature concerning the gold treatment of pulmonary tuberculosis discloses results sufficiently encouraging to demand further clinical study. Other matters dealt with are hexyl-resorcinal, antiseptic dyes, carbon tetrachloride and oil of chenopodium. Astringents are said to be contraindicated in gonorrhœa, as being antagonistic to Nature's method of cure. Calcium therapy for asthma, hay fever and parathyreoid tetany receives due consideration, and an instance of gangrene following the hypodermic injection of a solution of calcium chloride is related. The use of iodine in exophthalmic goître is adequately discussed. "Even minute amounts of iodine are sufficient to initiate symptoms of hyperthyreoidism in certain persons with adenomatous goîtres." Two cases are described in which death followed the injudicious use of iodine.

Much has been written about blood transfusion and the toxicity of sodium citrate in this connexion is mentioned. A single injection should not contain more than fifteen milligrammes per kilogram of body weight. A number of contributions deal with osmotherapy for the reduction of the cerebro-spinal fluid pressure; for instance, magnesium sulphate by mouth and the intravenous injection of a solution of dextrose and of hypertonic Ringer's solution. Dietetics have ample representation; milk diet, low protein diet and diets for gastric ulcer and diabetes. Also for diabetes the use of "Intarvin" (glyceryl ester of margaric acid) and inulin (as in artichokes). (Inulin is a peculiar carbohydrate body found mainly in the *Compositæ*.) Much also is written about cod-liver oil, with its antirhachitic vitamin D. It is claimed that vitamin D. produces ultraviolet rays which are emitted by oxidation. Articles deal with the antirhachitic activation of foods by ultraviolet radiation and also irradiation milk in rickets.

Some quotations from Frederick M. Allen's writings concerning diabetes may be made: "It is not true that insulin has reduced the need for correct diet. Rather it has increased it. All diabetics need diet; only a minority need insulin. It is not true that any form of diet spares the pancreatic function to the same degree as fasting and under-nutrition. It is not true that there is any specific harmfulness of protein in diabetes. It is not true that the so-called high fat diets have signified any new advance step in diabetic treatment. It is not true that insulin cures diabetes." The perlingual administration of "Insulin" is described, also the antagonism of "Insulin" and posterior pituitary extract.

All the latest information will be found concerning the thyreoid, parathyreoid (mobilizer of calcium), pituitary and suprarenal glands. Menninger maintains that "epinephrin may produce marked systemic effect on the circulation in some cases of hyperthyreoidism when administered by mouth." A. Oswald considers thyreoglobulin to be the active principle of the thyreoid and that thyroxin is a split product of the former, not possessing all the physiological properties of the thyreoid. The antiserum treatment of measles, poliomyelitis, scarlet fever, mumps and pneumonia are all critically discussed. Also the intraperitoneal injection of diphtheria antitoxin. Other subjects are: non-specific protein therapy, physostigmine (for abdominal distension), "Novasurol" as a powerful diuretic whose action is not thoroughly understood, benzyl compounds which have proved quite disappointing, ethylene as an excellent general anæsthetic, quinidine, "Ephredine," "Coramine," "Lobeline" as a respiratory stimulant and thiosulphate in metal poisoning. Finally, diathermy, X ray therapy and actinotherapy are mentioned.

A more complete compendium of a year's progress in therapeutic investigation than this admirable volume can barely be conceived.

THE VEGETATIVE NERVOUS SYSTEM AND DISEASE.

A STUDY of the vegetative nervous system in its relation to clinical medicine is an alternative and perhaps a more explanatory title of this book by Francis Marion Pottenger, of California.[1] Its object is to endeavour to interpret as far as may be possible in terms of visceral neurology symptoms found in the every-day clinical observation of visceral disease. It is a study of visceral disease not from the standpoint of the disease process, important as that is, but from the no less important standpoint of the patient who has the disease. An attempt is made to show how pathological changes in one organ affect other organs and the organism as a whole, through the medium of the visceral nerves. In substance we find a study of "viscerogenic" reflexes, which include all sympathetic reflexes, and are in reality manifestations of the fact that no organ is free from the influence of other organs and every organ influences other organs and structures. The first two hundred pages comprising the first two parts of the book are devoted to anatomy and physiology. These pages do not pretend to be original. They are written round the established findings of others, amongst whom Gaskell, Langley and Sherrington stand prominently. The result is a useful *résumé* of present day knowledge of the anatomy and physiology of the vegetative nervous system to serve as a basis for interpretation of indications arising out of disturbance of this system.

In Part III. we come to the practical and more important section consisting of a clinical study of viscerogenic reflexes, in other words, a study of those signs and symptoms by which reflexly through sympathetic connexions disease in viscera may be shown. For example, in the case of the stomach we know that there is a viscero-motor reflex shown by pain in the upper part of the left *rectus abdominis* muscle and a viscero-sensory reflex shown by pain in the left side of the epigastrium and often in the back and a parasympathetic reflex showing as a bradycardia. We also know that reflexly the stomach may be influenced by other organs and hyperchlorhydria, hypochlorhydria, hypermotility, nausea, vomiting and cardiospasm induced. It is these phenomena and corresponding phenomena in other organs which are discussed and so it is made plain to us that a knowledge of the visceral nervous system and an examination of the patient on these lines is highly important.

To the neurologist an interesting point in connexion with the book is that it is written by one who specializes in diseases of the lungs. On this account we think the writer specially deserves praise. He has taken a branch of neurology than which there is none more intricate, and by painstaking industry and evident ability provided what may be called a critical compendium, useful, trustworthy and up to date and interspersed with original observations.

We have indicated that the subject is a difficult one and though the material is well set out we fear that the average reader will at times find the argument difficult to follow. This, however, does not detract from the worth of a book which for all earnest students of neurology we give our recommendation.

[1] "Symptoms of Visceral Disease: A Study of the Vegetative Nervous System in its Relationship to Clinical Medicine," by Francis Marion Pottenger, A.M., M.D., LL.D., F.A.C.P.; Third Edition; 1925. St. Louis: The C. V. Mosby Company. Demy 8vo., pp. 394, with illustrations. Price: $6·50 net.

The Medical Journal of Australia

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Branches and Divisions.

SIX years ago we called the attention of our readers to the difficulties which were being experienced in South Africa by the members of the medical profession. There existed twelve Branches of the British Medical Association and the South African Medical Association with a central organization in Johannesburg. The Witwatersrand Branch of the British Medical Association determined to adopt a new constitution under the name of the Medical Association of South Africa, provided that arrangements could be made for this new organization to become federated with the British Medical Association. Since that time several attempts have been made to find an acceptable method of creating unity and solidarity among the medical practitioners of South Africa. In the past there has been much bitterness and lack of concord. This was largely the result of the peculiar racial and labour conditions, but to some extent faulty central organization, the isolation of medical practitioners living in the "black veldt" and the absence of opportunity to face problems collectively have contributed to the confusion. It happened that the Vice-President of the South African Committee and the President of the South African Medical Association were in London last year. Both were extremely desirous of finding a solution of their difficulties. Both approached the officials of the British Medical Association and discussed the situation with laudable frankness and great earnestness. The result of these conversations was a visit of Dr. Alfred Cox, the Medical Secretary of the British Medical Association, to South Africa. Dr. Cox travelled about eleven thousand miles within South Africa, interviewed about seven hundred practitioners and gained first hand information concerning the wishes, the aspirations, the doubts and the demands of the majority. Through his good offices a compromise has been reached. The South African Medical Association is to be disbanded; there will be one medical organisation in South Africa, to be called the South African Medical Association (British Medical Association). This clumsy name removes many difficulties. All the privileges of membership of the British Medical Association will be maintained. Those who are not members of the British Medical Association, will have the satisfaction of knowing that the representative organization will be truly South African in spirit and in deed, that it will have complete autonomy and that its executives will act for the benefit of South African practitioners. Dr. Cox strongly urged those in authority to realize the difference between Divisions and Branches of the British Medical Association and to adopt the best means of bringing the "black veldt" doctor into intimate touch with his colleagues by the exploitation of the provisions of the constitution of the Association. He pointed out that it would be useless to create Divisions within the several Branches, because the Branches serve to coordinate the work of the constituent Divisions and under the conditions obtaining in South Africa with its vast distances between the more important centres, the members of the Divisions could not attend Branch meetings for the purpose of coordination of effort. Far better, he maintained, to create fresh Branches which would be independent of all control. He further advised the establishment, as soon as this might be practicable, of a whole-time, salaried medical or organizing secretary of the South African Committee.

While there are no racial difficulties in Australia and labour conditions do not call for any special effort to regulate medical practice, the Branches of the British Medical Association in Australia are faced with a problem in regard to the outback districts similar to those referred to above. Hitherto the remedy sought has been to establish voluntary bodies within the Branches either under the name of local medical associations or of "divisions." These bodies have no status in the British Medical Association. Their constitution provides that the members shall be members of the British Medical Association residing within the defined areas. They

have a very restricted autonomy, for even if they adopt any policy that may find favour among their members, this policy cannot be carried into action without the sanction of the Branch. They serve one extremely useful purpose. They can arrange meetings of the members. Experience has shown that both in New South Wales and in Victoria these voluntary bodies have brought members together for the discussion of scientific and professional problems. Men living at great distances from the capital cities cannot possibly attend meetings of the Branch or of the scientific sections. A healthy practice has been introduced within recent years in order to enhance the value of the local country meetings. Members of the Branch Councils have journeyed to these distant parts to contribute to the success of the meetings. A movement is on foot whereby prominent members of the profession will be induced to attend the country meetings and read papers on subjects in which they have gained large experience. But even with these undoubted advantages the system does not solve the real difficulty. There are very many districts in every State in which the medical practitioner still has no opportunity of meeting his colleagues and discussing their common problems. Moreover the only means of ascertaining the opinion of every medical practitioner in the State or Commonwealth on a pressing question is the referendum and this instrument is so defective as to be practically useless. Perhaps it will be possible for the Federal Committee or the future Federal Council to engage the services of a travelling organizing secretary whose function it would be to visit every part of the vast continent and to urge the doctors in all districts to form small voluntary bodies for the purpose of discussion. The organizing secretary could be the indirect means of bringing every member of the British Medical Association into a position of active participation in the conduct of its affairs. That should be the aim of those responsible for the development of the Association in Australia. Some day a method may be evolved for the holding of meetings analogous to the Representative Meeting of the British Medical Association. Until this is done, a truly democratic government of the representative organization of the medical profession in Australia will be impossible.

Current Comment.

TREATMENT OF INTESTINAL PARASITES.

IT would be a platitude to say that the present day facilities for quick travelling have their bearing on the prevalence and spread of disease. Any student of epidemiology can quote numerous instances of the way in which one individual has been the means of carrying infection from a stricken district to one which is unaffected. The ease with which great distances can be covered, has its bearing also on other than infectious diseases. Persons suffering from non-infectious tropical diseases, for example, are seen very much more frequently in temperate climates than was formerly the case and medical practitioners in all parts of Australia should familiarize themselves with the clinical picture produced by at any rate the commoner tropical ailments and with the measures most suited for combating them. Some of the intestinal parasitic worms discussed by Dr. G. M. Heydon in this issue are confined to certain areas in Australia, but medical practitioners in all parts will be well advised to study his article with care. Dr. Heydon has discussed the therapeutic use of carbon tetrachloride, of oil of chenopodium and of a combination of both drugs. He has shown that when reasonable care is taken in the dosage, satisfactory results can be produced. At the same time he has shown not only that symptoms of an unpleasant and even dangerous nature may sometimes occur, but that it is practically impossible by means of drugs to remove all the parasites from the intestinal tract of man.

Dr. D. De Rivas has recently investigated another method of treatment which may prove to be of great use in the eradication of intestinal parasites.[1] The method may be described in a few words as the application of heat to the mucosa of the intestinal canal. Dr. De Rivas points out first of all that of the three requirements for the maintenance of life, food, moisture and heat, the last named is so important that slight variations in temperature cause profound changes in the life history of the organism. He refers to the effect of the alteration of temperature on bacterial growth and to the fact that spontaneous discharge of round worms and tape worms through the normal channels is seen during the course of infections accompanied by high fever. In the course of routine preparation of materials for his class Dr. De Rivas found that when the intestine of a dog infested with *Dipylidium caninum* was removed, split longitudinally and placed in a water bath gradual heating had a remarkable effect on the parasites. They gradually became more active as the temperature rose to 41° C., 42° C. and up to 45° C. They finally withdrew their heads from the mucosa and in a few minutes were floating in the fluid. Experiments were then carried out with cestodes, nematodes and with specimens of *Entamœba histolytica*. It was found that while

[1] *The American Journal of Tropical Medicine*, January, 1926.

the parasites might live for several days at room temperature, they did not live nearly so long at 37° C. and were killed in five or ten minutes at 45° C.. The next step in the investigations was the attempted removal of intestinal parasites from dogs by the action of heat. A dog, heavily infested with round worms and tape worms, was anæsthetized. The abdomen was opened and the duodenum after exposure was pierced by a trocar. The lumen of the bowel was then irrigated with saline solution whose temperature varied between 52° C. and 55° C.. After nine hundred cubic centimetres of fluid had been injected within the space of twenty minutes, the dog began to discharge the parasites from the anus. Seven complete tape worms and twenty round worms were collected. All were dead. On the following day the dog became ill and on the fourth day it died. At autopsy no parasites were found in the bowel, but the mucosa was the site of an acute hæmorrhagic enteritis. In a series of subsequent experiments it was found that a temperature of 45° C. to 47° C. could be maintained for ten to fifteen minutes and that this was sufficient to cause expulsion of the parasite without the production of any appreciable pathological changes in the intestine. In these experiments the solution was introduced into the bowel by means of a tube passed down from the mouth. In another series of experiments colonic lavage with warm saline solution was found still more satisfactory. Saline solution with a temperature of 45° C. to 47° C. could be introduced by a rectal tube and maintained for fifteen minutes and a temperature of from 47° C. to 50° C. could be borne for a few minutes without the production of any appreciable after effect.

Dr. De Rivas then applied the method to man. In the first instance he chose a person who was normal except that he suffered from chronic constipation. He found that after three or four injections given at intervals of one week he was able to use twelve to fifteen hundred cubic centimetres of fluid at a temperature gradually increased to 45° C., 46° C. and 47° C. This was maintained without any ill-effects for ten to fifteen minutes. The patient experienced a general feeling of heat during the operation and the temperature as registered in the mouth was 39° C.. Patients suffering from amœbic dysentery and from infestation by seat worms, hook worms and tape worms were then treated by this method. Lavage was carried out by means of the duodenal tube or the rectal tube as required. Full details of the patients' histories are given. Parasites were always expelled and no ill-effects remained. These accounts are interesting and it is not necessary to give details of them. The apparent ease with which a tape worm (*Tænia saginata*) was removed by duodenal lavage in forty-five minutes, is to say the least of it highly satisfactory.

In discussing this treatment Dr. De Rivas draws attention to the general employment of heat in the treatment of disease by all races. He holds that in addition to changes in the electrical potentiality of the cells and tissues which are believed to be indiduced by X rays and radium, the local variation in temperature caused by the radiation is probably an important contributing fact to their beneficial therapeutic effects. He points out, moreover, that the high temperature associated with certain infective diseases undoubtedly contributes to their cure, the thermogenic reaction of the body being detrimental to the life and multiplication of the invading microorganisms. This view is supported by clinical experience that acute bacterial infections unaccompanied by fever are more usually fatal. Dr. De Rivas also regards the beneficial results following malarial infection in general paralysis of the insane as due to the action of heat on the spirochætes.

The observation of Dr. De Rivas and his case reports indicate that the method described by him will probably be of considerable assistance in the treatment of intestinal parasitic infestations. It is hoped that his findings will soon be confirmed. It seems rather a pity that he is inclined, as is so often the case, to run it to death. He suggests that it may be possible to use this intraintestinal thermal treatment for such conditions as ulcer of the intestine, "autointoxication, intestinal in origin" and as a substitute for resection of the colon in the treatment of certain forms of insanity, believed to be caused by intestinal autointoxication. He thinks it possible, too, that by the early and rapid elimination of the poisonous substances through the bowel it may be of use in trichiniasis and in bichloride of mercury, mushroom and botulism poisoning. He promises a later report on these matters.

EOSINOPHILE CELLS IN ACHYLIA GASTRICA.

EOSINOPHILIA is found on examination of the blood in many conditions and a determination of its presence is frequently of diagnostic significance. Instead of an eosinophilia, however, a local aggregation of eosinophile cells occurs in certain lesions such as cancer of the stomach. Professor Carlos Bonorino Udaondo has recently discussed the diagnostic value of the presence of eosinophile cells in stomach washings in *achylia gastrica*.[1] His observations have been on six cases of achylia. One patient suffered from malignant disease of the stomach and in the remaining five persons chronic gastric changes were associated with old age in one instance, tuberculosis in another and alcoholism in three. In no case was an eosinophilia found on examination of the blood, but in every instance eosinophile cells were found in the stomach washings in varying numbers. Professor Udaondo emphasizes the fact that an organic lesion was present in all these cases and points out that it confirms the findings of Disqué that eosinophile cells are found only in achylia dependent on a lesion of the mucous membrane. He has been unable to find eosinophile cells in achylia of functional origin, either permanent or transitory. He gives no details of these cases. By the term functional Professor Udaondo evidently refers to the absence of an obvious pathological lesion. How far a permanent achylia, presumably functional, would depend on intracellular change is another matter.

[1] *La Presse Médicale*, April 4, 1925.

Abstracts from Current Medical Literature.

MORBID ANATOMY.

Lymphangioma of the Fallopian Tube.

LAWRENCE W. STRONG (*American Journal of Obstetrics and Gynecology*, December, 1925) describes two cases of lymphangioma of the Fallopian tube. Five cases are recorded in the literature and all these are regarded as true tumours and not as local dilatations of lymphatic vessels. He holds that dilatations of preexisting channels do not take the form of circumscribed nodular tumours. Both tumours were about half a centimetre in diameter and embedded in the wall of the tube. Microscopically both nodules consisted of lymphatic spaces lined by a flattened endothelium, one with a tendency to proliferation, the other apparently stationary.

The Origin of the Lepra Cell.

JEAN OLIVER (*Journal of Experimental Medicine*, February 1, 1926) describes the origin of the lepra cell. The author states that the most striking feature of the anatomical change which developes in leprosy, is the occurrence in the lesion of great numbers of large phagocytic cells with bacilli. They may be considered analogous to the epithelioid cells of the tubercle. The morphology of the cells is constant. They vary in size from a lymphocyte to several times larger and the protoplasm is filled with vacuoles and bacilli. The lesions found in all the animals are substantially the same. The essential process in all the tissues is the development of nodules of lepra cells followed by a late necrosis. The nodules are similar whether they be produced in skin, subcutaneous tissues or internal organs. The cells of the nodule are large, oval cells, except when they are compressed by crowding and the protoplasm is filled with abundant vacuoles. The cell is so filled with acid-fast bacilli that all details, except the compressed nucleus, are obscured. A number of bacilli lie free in the tissues apparently liberated by the rupture of a lepra cell. In the subcutaneous tissue the nodules are composed of histiocytes almost to the exclusion of the fixed tissue cells and there is a gradual transformation from their normal, typical appearance at the periphery of the nodules to the adult leprous nodule. The other types of cells which lie around the leprous nodule, form a granulation tissue and take no part in the formation of the leprous cells. In the liver the Küpffer cells proliferate and become typical lepra cells.

Chordoma.

MATTHEW J. STEWART AND JOSEPH EDOUARD MOURIN (*Journal of Pathology and Bacteriology*, January, 1926) review the chordomata and report a new sacro-coccygeal tumour. The patient in whom this tumour was found, was a man, aged fifty-eight. He had been under the care of the authors for two years and had suffered from a lump in the sacral region for six years. Histological examination of the tumour revealed that at the margin the tumour was enclosed in a thick capsule from which the interlobular trabeculæ ran into the tumour. The blood vessels were confined to the trabeculæ and were often surrounded by collections of small lymphocytes. There were also areas of hæmorrhage and necrosis, simulating infarction. Blood pigment was present and many striped muscle fibres were seen at the periphery of the tumour. The parenchymal cells were rounded, polygonal and closely set and distinctly epithelial in character. All grades of vacuolation were seen in the "physaliphorus" cells which were composed merely of a nucleus with a small ring of cytoplasm, a group of very large vacuoles and a certain number of the vacuoles contained mucin. The younger cells contained two or three nuclei. Descriptions are given of all the published cases in which the authors are satisfied as to the diagnosis. In the general description the sites of occurrence of the chordoma are mentioned and in regard to the morbid anatomy they state that one of the most striking features is the locally destructive effect on bone. On the one hand the base of the skull is penetrated and destroyed, on the other the sacrum and innominate bones. No widespread infiltration occurs and metastases are very infrequent.

Calcification in the Basal Ganglia of the Brain.

E. WESTON HURST (*Journal of Pathology and Bacteriology*, January, 1926) gives the results of his work in regard to calcification in the basal ganglia. One hundred brains were examined and the results were elaborated. The conditions included *encephalitis lethargica*, cerebral vascular lesions, general paralysis of the insane and spinal tumour. In his discussion he states that the so-called calcification of the arteries in the anterior half of the *globus pallidus* is an extremely common occurrence and is found in many diseases affecting various parts of the central nervous system. In his series it was present in 50% of the cases at all age periods between the years of twenty and eighty-one. The deposit occurs chiefly in the *tunica media*, but sometimes in the *tunica adventitia* thence spreading to the *tunica media*. The process consists in the infiltration of one or more of the vessels with iron salts, calcium salts being absent. In the majority of the cases and in those not characterized by vascular lesions, degeneration bodies (frequently infiltrated with iron salts) are found in the lenticular nucleus and especially in the *globus pallidus*. The degeneration is present in the latter half of life and is no indication of the disease from which the patient may be suffering. The deposition of iron salts is to be correlated with the high iron content of these parts of the brain.

Phagocytic Cell in Pernicious Anæmia.

CHARLES A. DOAN (*Journal of Experimental Medicine*, March, 1926) publishes his findings of the type of phagocytic cell which is found in the bone marrow in increased numbers in pernicious anæmia when the supravital technique is used. Ten cases are recorded with differential marrow cell counts. It was seen that in the first three cases (pernicious anæmia) the percentage of these cells was eight to ten. Qualitatively they all manifested extreme phagocytosis, many containing more than twenty ingested red blood cells of which the great proportion were nucleated red cells. It was inferred from this that the bone marrow was hyperplastic with a rapidly progressive anæmia, because the peripheral blood at any time contained only an occasional nucleated red cell. Microscopically all the marrow cells reacted vitally and manifested all stages of maturity and activity of the clasmatocytes. In normal marrow the majority of the myelocytes are in the preleucocytic stage and in pernicious anæmia the middle-aged myelocyte, a type less readily available for quick transference to the peripheral stream, was found. Megaloblasts were found only in the cases of pernicious anæmia. In the first two cases of pernicious anæmia the spleen was enlarged and in them small lymphocytes predominated and occasional myelocytes were observed. However only a very occasional phagocytic clasmatocyte was seen, but these were similar to those in the bone marrow. In the other series of cases the clasmatocytes ranged from 4% to 8%. The author suggests that if it be ultimately found that the endothelium of the adult human being is the *sine qua non* for both definite red blood cells and clasmatocytes and one group of phagocytes, then the disease known as pernicious anæmia has the characters of a vicious circle, of death within one family of closely related cells. That is, some unknown stimulus gives rise to great numbers of a type of cell which ingests and disintegrates red cells often before they have reached the stage of complete maturation.

Syphilitic Myocarditis in the Rabbit.

WADE H. BROWN AND LOUISE PEARCE (*The Journal of Experimental Medicine*, April 1, 1926) describe a syphilitic myocarditis occurring in rabbits. They state that the disease produced in rabbits by local inoculation with highly virulent strains of *Treponema pallidum* bears a close resemblance to human syphilis in many respects and is distinctly different in others. There is a primary lesion at the seat of inoculation and the spirochætes are conveyed all over the body by means of the blood vessels and lymphatics, causing secondary lesions in skin, mucous mem-

branes, bones and eyes. They state that there is no doubt that the infection differs from that in man in that visceral affections do not occur. Their investigations were carried out over a period of ten years and six cases of myocardial lesion are described. Examination for treponemata (dark ground) in two cases was unsuccessful and these same specimens and two others were examined by Levaditi's method without success. Microscopical examination revealed that the lesions were of a common type and in this the fundamental lesion was a myocardial degeneration and necrosis associated with connective tissue hyperplasia and cellular infiltration. The degeneration was widespread and the necrosis of individual fibres was most prominent in the vicinity of the small and medium sized blood vessels. The degeneration was granular and hyaline and the connective tissue growth in the most advanced lesions was of a myxomatous nature. The discussion centres around the highly significant features of the primary degeneration and necrosis of individual fibres together with the interstitial œdema of the earliest changes being in association with the endocardium and the fact that the lesions occupy the same position and are of the same character as syphilitic myocarditis in man. Moreover, the lesions are rare and they occurred during a period in which syphilis among the animals was particularly severe. They are the first cases of syphilitic myocarditis or visceral syphilis in the rabbit to be reported.

MORPHOLOGY.

The Golgi Apparatus.

ROBERT H. BOWEN discusses the significance of the Golgi apparatus, a structure which has been found constantly in all cells (*Anatomical Record*, February 25, 1926). After a long survey of the work of various authors Bowen says that it seems clear that this structure does not itself become transformed into various products of differentiation as was once so widely claimed for the mitochondria. Thus its substance appears as a relatively stable heart of the protoplasm. Furthermore the Golgi apparatus is found undergoing changes of position, size and topography which distinguish it sharply from the rather inert (?) mitochondria and which point distinctly to its immediate participation in the common operations of living matter. Hence has arisen the oft expressed belief that the Golgi apparatus is intimately involved in cell metabolism. It is found particularly active in cells differentiating products that are not to become a permanent part of the cell system. Thus secretory granules, yolk, the acrosome, materials for bone and tooth *et cetera* are all products whose tenure of life in the cell is brief. This possible activity of the Golgi apparatus as a synthetic centre, more particularly its probable rôle in the production of enzymes as expressed in many types of "zymogen" granules, suggests the further possibility that the Golgi apparatus may be the real centre of formation for enzymes in general.

Experiments on the Embryonic Heart.

W. M. COPENHAVER, working under Professor Ross Harrison in the Osborne Zoological Laboratory at Yale, has carried out a number of experiments on the development of the heart in the embryo salamander (*Journal of Experimental Zoology*, February 5, 1926). Using the technique elaborated many years ago by Ross Harrison for nis experiments on neurones and the growth of nerve fibres, Copenhaver has attempted to determine the potentialities of the mesoderm from which the heart developes. When the mesoderm which forms the heart only, is removed at an early stage, the surrounding mesoderm possesses the potency to redevelope a normal heart (the actual stage was given the empirical number twenty-nine and is defined accurately in his description). By extirpation of a larger area of mesoderm and by covering the wound with ectoderm and mesoderm from the flank development of the heart is prevented. Embryos without circulation usually live from two to three weeks, but differentiate normally for only the first few days following the operation. Reversed transplantations result in the development of reversed hearts which pulsate from the anterior to the posterior end but without circulation. By removing a median area and thus splitting the rudiment of the heart into two parts two hearts may be produced which are functionable to the extent of having a circulation. In form the left approximates the normal; the right invariably manifests *sinus inversus*. After removal of an anterior heart or of the right heart at the standard early stage the remaining half can redevelope a normal heart. After extirpation of part of the heart just preceding the stage at which pulsations commenced, a complete heart often developed. The process of development, however, was one of regeneration. After extirpation of any part at a stage in which pulsations had commenced, regeneration does not occur. The results of the experiments indicate that the heart of *Amblystoma punctatum* is an equipotential system in the sense that (i.) any part as large as a half possesses potency for developing a complete heart; (ii.) one rudiment is capable of forming two functional organs and (iii.) two rudiments can be made to form one functional organ. At the earliest stages in which operation was undertaken, stages considerably preceding the loss of equipotentiality, there exists within the rudiment itself determination of the postero-anterior axis.

The Mammalian Myenteric Plexus.

F. W. CARPENTER (*Anatomical Record*, July, 1924), in discussing the connexions in the mammalian myenteric plexus between the enteric neurones and extrinsic nerve fibres, gives an account of the relationships of the splanchnic and vagus nerves with the ganglion cells of Auerbach's plexus. He concludes (i.) that the extrinsic fibres end in the plexus, (ii.) that there are two modes of termination, pericellular arborizations and less specialized abrupt endings of freely branching axones which are intercellular, and (iii.) that certain observations, physiological and histological, offer indirect evidence suggesting that the preganglionic vagus fibres end in the pericellular structures, while the postganglionic splanchnic fibres terminate by branching in the intercellular fibre complex.

Studies on Plain Muscle.

O. W. TIEGS (*Australian Journal of Experimental Biology and Medical Science*, Volume 1, 1924) describes plain muscle tissue, including the structure and innervation of plain muscle fibres and the structure and function of its connective tissue elements. His work is mainly based on the study of preparation of frog's stomach stained intravitally with methylene blue. The author demonstrates the presence in the muscle coat of the stomach of a nerve net to which is ascribed diffuse transmission of impulses.

Experimental Degeneration of the Extrinsic Nerves of Small Intestines.

SYDNEY E. JOHNSON (*Journal of Comparative Neurology*, April 15, 1925) describes the results obtained by cutting separately the vagal and splanchnic fibres to the small intestine. His observations reveal (i.) the presence of only one type of nerve cell in myenteric plexus, (ii.) no evidence of true nerve nets, (iii.) no synapses between local elements, (iv.) association of extrinsic and intrinsic elements by the usual type of sympathetic intercellular plexus and (v.) that the extrinsic fibres which enter the gut wall and form a part of the intercellular plexus, are of vagal origin. The vagal neurone thus represents the preganglionic link whereas the postganglionic links are the local neurones whose cell bodies compose the myenteric ganglia. The cell bodies associated with the splanchnic nerves are situated in the cœliac or other extraintestinal, sympathetic ganglia.

Cutaneous Nerves of the Metazonal Region of the Leg and Foot.

CHARLES KOSINSKI (*Journal of Anatomy*, April, 1926) gives an account of the great variation in the distribution of the cutaneous nerves of the leg and foot observed by him in the dissecting room and in the course of several personal dissections. His aim was to establish the types of variation met with. He describes three main types of distribution of cutaneous nerves on the dorsum of the foot and three other rare types.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Royal Prince Alfred Hospital on June 10, 1926. The meeting took the form of a series of clinical demonstrations.

Sequelæ to Encephalitis.

DR. R. A. NOBLE on behalf of SIR JOHN MACPHERSON and himself showed several patients in whom sequelæ to encephalitis were manifest. He said that postencephalitic Parkinsonianism was said to occur in 25% of cases. Symptoms might manifest themselves six to twelve months after the infection or not for years. Increase in rigidity was usually present and this might or might not be accompanied by tremor. The tremor could be removed by injection or cocaine into the muscles. Ramisection had also been used. The symptoms were not usually affected by drugs. Slowness of action generally characterized affected persons, but mental impairment was as a rule absent. In regard to the pathology of the condition Dr. Noble pointed out that the caudate nucleus and the *substantia nigra* manifested degeneration of cells.

The first patient shown by Dr. Noble was a man aged forty-five years. He had been admitted to hospital on January 27, 1926, with a history of having had influenza four months before admission. On admission the patient had complained of pains in the calves of the legs and he had suffered from neurasthenic symptoms. Dr. Noble pointed out that the patient's left arm and leg were more spastic than the right. The left pupil was smaller than the right. Both pupils reacted to light and accommodation. The patient's expression was fixed. He suffered from tremor of the left hand and from weakness of the left side of the face. Treatment had been carried out by means of hyoscine hydrobromide and tincture of belladonna and as he was not sleeping well, potassium bromide had been added.

Dr. Noble said that the condition might be precipitated by trauma, in other words trauma unmasked a latent condition. This was demonstrated in the second patient, a man, aged forty-two years. He had been quite well until a box fell on his head two years previously. He had been in Sydney Hospital for five weeks. Six weeks after his discharge from that institution tremor had appeared in both hands and feet. The tremor had been reduced considerably by means of drugs. X ray examination of the skull had revealed no bony lesion. It had been found that the patient reacted best to potassium bromide given by the mouth.

The third patient was a man, aged thirty years, who had been admitted with a history that he had been unable to sleep for two or three weeks. Six weeks later tremor began and had progressed since. The tremor had been accompanied by a considerable degree of spasticity and had been confined to the right arm and leg. In June, 1925, Dr. Royle had performed the operation of cervical ramisection. The spasticity had become much less, but the tremor had not improved.

Aortic Aneurysm.

DR. A. J. COLLINS, D.S.O., M.C., showed a male patient, aged forty-five years, who had complained of pain in the back and chest for six weeks. The pain was situated under the sternum and in the region of the left nipple and the left shoulder blade. He complained of no cough. On examination movement, vocal resonance and breath sounds were diminished over the lower lobe of the left lung. An aortic systolic murmur was present and the second sound at the aortic area was accentuated. A tracheal tug was present. X ray examination had yielded definite evidence of aneurysm of the transverse arch of the aorta. The response to the Wassermann test was "+++."

Colles's Fracture.

DR. LENNOX TEECE showed a number of patients suffering from Colles's fracture and detailed the treatment that had been adopted as a routine in the Orthopædic Department. This consisted of reduction, always under an anæsthetic, the impaction being undone by force applied directly to the lower fragment and not by the classical but ineffective method of traction on the hand. Daily massage was instituted from the first, movements of the wrist were commenced on the fifth day and movements of pronation and supination on the tenth day. The splints were discarded on the fourteenth day and gentle use of the hand encouraged and the patients were usually discharged on the twenty-first day. Fractures in elderly people which were impacted without appreciable deformity, were not disimpacted; neither were they put on splints for even a day, but immediate massage and movement were carried out. Cases were shown in different stages of progress that had been reduced at times varying from one day to three weeks previously.

One patient was instanced who had not sought treatment at the Orthopædic Clinic till five weeks after the date of injury. In the interim she had been treated elsewhere and though reduction of the deformity had not been secured, she had been kept uninterruptedly immobilized in splints for four and a half weeks. After four weeks' massage and movement and nine weeks after the date of fracture she still had excessive stiffness of her wrist and fingers and radio-ulnar movement was abolished.

The point was emphasized that a patient with a malunited impacted Colles's fracture who had never had any treatment, secured a far better functional result than one who was put in splints for several weeks in spite of unsuccessful attempts to disimpact the fragments.

Progressive Facial Hemiatrophy.

DR. W. C. B. HARVEY showed a female patient, aged eighteen years, who had one child, a year old. About two years previously the patient had noticed a patch on the outside of the left cheek, white and scar-like and the size of a florin. This patch had slowly spread over the cheek which became blotchy. Six months previously the lower eyelashes had fallen out and those in the upper lid were beginning to do the same. Dr. Harvey pointed out that the cheek was drawn in and he said that although at times a sore feeling was present, making it difficult for the patient to open her mouth, no actual pain ever occurred. The teeth on the left side were decayed. Seven had been removed from the upper jaw in the previous twelve months and those in the lower jaw were becoming loose. Investigation of the family history failed to reveal anything of a similar nature and the patient had had no previous illnesses.

On examination an extraordinary contrast between the two sides of the face was manifested. One side of the patient's face was that of a girl and the other had the appearance of an old woman. Shrinking and wasting of all the tissues were present. The shrinking included the bony structure, the soft tissues of the cheek and the tongue. The skin was thickened and hard with white patches on a red background. The condition was one of scleroderma. The facial muscles moved and their electrical reactions were normal. Sensation was unimpaired. The neck, arms and chest were normal and the reflexes were normal.

Dr. Harvey explained that nothing definite was known of the pathology of the condition. An interstitial neuritis of the fifth nerve was not the explanation. The condition began at puberty and it had been suggested that it was due to an arrest of development towards the end of the growing period. The association with scleroderma was interesting. Oppenheimer held that the two conditions were undoubtedly closely allied. They had been reported as occurring together. For this and other reasons Oppenheimer was inclined to the view that facial hemiatrophy was an affection of the sympathetic nervous system. It was generally agreed that scleroderma was a trophoneurosis. It was progressive and not dangerous to life. Dr. Harvey said that no treatment appeared to be of any use. He proposed to wait until the spread of the condition had ceased and then to place a pad inside the patient's mouth in order to improve her appearance.

Foreign Body in the Urethra.

MR. R. GORDON CRAIG showed a foreign body consisting of a coil of copper wire and a bullet which he had removed from the urethra at the neck of the bladder of a young

man. The foreign body had been removed by traction after the injection of a solution of cocaine to the urethra.

Ureteral Calculi.

Mr. Gordon Craig also discussed the subject of ureteral calculi and illustrated his remarks by a series of specimens and some excellent skiagrams. He said that the presence of a shadow on a skiagram in the position of the ureter did not justify a diagnosis of ureteral stone. Calculi might be found in any part of the ureter. He illustrated his remarks by describing two cases. In one case an obstruction had been felt in the ureter and an opaque ureteral catheter had been left *in situ*. A pyelogram taken subsequently had revealed some dilatation of the pelvis of the kidney, the early stage of hydronephrosis. In the second case an irregular shadow had been found on radiological examination and the question had arisen as to whether a stone was present in the ureter or the bladder. The radiologist's report had been to the effect that the shadow indicated the presence of a stone. On cystoscopical examination no stone had been found near the ureteric orifice in the bladder, but the orifice had appeared perched on the top of an eminence projecting into the bladder. A stone had also been discovered in the kidney area. The lower portion of the ureter had been exposed by the extraperitoneal route. It had been incised and several stones had been removed. In the shadow on the skiagram a gap had divided the dense area into two parts. The gap in the dilated portion of the ureter containing the stone had corresponded to the position of the broad ligament. The dilated area had consisted of two compartments. It had been impossible to remove the stones from the second compartment through the incision already made and Mr. Craig had found it necessary to open the bladder and slit the ureteric orifice in order to remove them.

Diverticulus of the Œsophagus.

PROFESSOR F. P. SANDES showed a male patient who had suffered from catarrh for seven years. Six months before admission to hospital he had experienced some difficulty in swallowing. He had suffered from pneumonia and the catarrh had become more severe. On X ray examination a diverticulum of the œsophagus had been found with its orifice opposite the fifth cervical vertebra. It had extended donwards behind the *manubrium sterni*. Professor Sandes had made an incision on the left side of the neck and had found the pouch which was not adherent. He had feared that if he amputated the pouch, leakage might occur, so he had turned it upwards and had cut off its most distal portion. He had then explored its interior in order to discover whether any obstruction was present. A band had been found near the entrance and Professor Sandes had divided this in a manner similar to that used for the pylorus in the Rammstedt operation. He had then hitched the diverticulum upwards and had drained it by a tube through the wound in the neck. The tube had been allowed to remain for eight days and had then been removed. The patient had since been well and was not complaining of any catarrh. Professor Sandes expressed the opinion that the man would have no further trouble unless he took to standing on his head.

Syphilitic Osteitis of the Spine.

DR. R. ANGEL MONEY on behalf of DR. SINCLAIR GILLIES showed a male patient, aged thirty-five years, who had been a carpenter until 1917 and a policeman since. His wife had four children and all were healthy. She had had no miscarriages. Sixteen and a half years previously the patient had contracted syphilis and had been treated by intravenous injections and intramuscular injections for twenty-one months. He had been pronounced cured after his blood had failed to react to the Wassermann test on four occasions spread over a period of two months after completion of treatment. Three years previously the patient had been perfectly well and then he had begun to complain of lightning pains which commenced in the thighs and legs and continued for a period of eighteen months. At this time he had suffered from a severe attack of pain lasting for nearly twelve hours. He had then been free for seven months and during this period felt quite well. Twelve months prior to demonstration the patient on one occasion had felt a "click in his back" while straightening himself after stooping. Two days later his right leg had become numb below the knee and the left leg was similarly affected. The day after this he had fallen while walking, had been unable to rise and had been assisted to his bed. At this time he had been admitted to the Tamworth Hospital and one week later he had felt a lump in the lower part of his back. After one month the lightning pains had recurred in his thighs and spread to his legs, abdomen, chest, head and arms. During his six weeks' stay in hospital he had received antisyphilitic treatment by three intravenous injections.

The patient then came to Sydney and had consulted Dr. Harold Ritchie. He had been admitted to Sydney Hospital and had remained there for eleven weeks. He had subsequently been treated as an out-patient. As far as Dr. Money could ascertain no Wassermann test had been carried out at this time. The spine had been examined by X rays and the lesion diagnosed as "specific osteitis," but no mention had been made of any vertebral collapse. While at Sydney Hospital he had received six intravenous injections and eight intramuscular injections of an arsenical preparation. After an interval of eight weeks he had received a further series of four intravenous and eight intramuscular injections. He had taken iodide of potash and mercury continuously during this period.

After consulting Dr. Sinclair Gillies he had been admitted to the Royal Prince Alfred Hospital eighteen days prior to the meeting. On admission the only additional history to that already stated had been one of nocturnal incontinence of urine, present since childhood.

Dr. Money pointed out that the patient was suffering from paresis of the dorsi-flexors of both feet, more particularly on the right side. His gait was not of the tabetic type, but rather of the steppage variety. Slight wasting of the anterior tibial group of muscles of the right leg was present. Rombergism was present. Patchy anæsthesia to light touch was present in both legs and anæsthesia was complete over the distribution of the fifth lumbar segment in both legs. Patchy anæsthesia and delayed conduction to pressure sensation was present in both legs. Pain was appreciated as touch in both legs and conduction was delayed. Patchy impairment to sensation of heat and cold was present. In regard to the sensation of passive position and movement considerable delay was present. The conjunctival and palatal reflexes were present and the pupils reacted to light and accommodation. The abdominal reflexes were greatly exaggerated especially on the left side. Knee jerks and ankle jerks were absent. The plantar reflex could not be elicited. Ankle clonus and patellar clonus were absent. Cranial nerves and trophic functions were normal. Dr. Money demonstrated a mass projecting backwards at the level of the fifth lumbar spine. Above this the back was hollow and the fourth lumbar spine appeared to be depressed. The mass was fixed and apparently consisted of the fifth lumbar spine. The fourth lumbar vertebra appeared to be displaced downwards and forwards and a clicking sensation was present on movement. There was no tenderness. The rectum was very roomy. The specific gravity of the urine was 1020, it was acid and contained a heavy cloud of albumin. The blood had been subjected to the Wassermann test on two occasions and the reaction was "+++." On June 6, 1926, the electrical reaction of the muscles had been tested. The galvanic and Faradic responses were normal in the left lower extremity. The galvanic response was normal in the right lower extremity and the Faradic response was very weak in the anterior tibial group of muscles; all other muscles were normal. On X ray examination osteosclerosis of the fourth and fifth lumbar vertebræ with some collapse had been found. The radiologist had regarded the condition as possibly a syphilitic disease of the spine; an osteitis due to *Bacillus typhosus* could not be excluded and the appearance was too dense for tuberculosis.

Dr. Money said that in view of the generalized pains of a lightning character, Dr. Gillies regarded the condition as one of tabes together with a syphilitic osteitis of the spine and collapse of the fourth lumbar vertebra. The leg condition was a neuritis due to pressure on the nerve

trunks, it was not a tabetic condition. The point of interest was the treatment by "Salvarsan" sixteen years previously and the four failures to react to the Wassermann test.

Ramisection for Parkinson's Disease.

MR. H. R. G. POATE showed a patient who had been operated on for a postencephalitic Parkinsonian syndrome in which the main feature had been an excess of plastic tonus causing such a degree of general rigidity of the limbs as to result in total incapacitation of the patient. The patient, a male, aged twenty-nine years, had always been healthy and active up to Christmas time, 1923, when he lost the use of his limbs. The upper extremities had first been affected and a very obvious tremor had been present. This condition after lasting for some days had cleared completely and the patient had been able to return to work. About a week later it had recurred and had since persisted and given rise to a good deal of pain in the limbs. He had been under treatment continuously and had been referred to the Royal Prince Alfred Hosiptal from Broughton Hall by Dr. Bostock in December, 1925. He had then been in a condition of general rigidity which was most obvious in the limbs of the right side of the body and least in the left superior extremity. His bowels had been obstinately constipated. The patient had experienced great difficulty in commencing any movement and considerable concentration of effort had been required to carry out a movement. The serum had failed to react to the Wassermann test and X ray examination of the skull had failed to reveal any bony abnormality. A cinematograph film was shown through the courtesy of Dr. N. D. Royle and in this were seen the patient's condition in regard to movement and his attempts at walking. Mr. Poate then asked the patient to perform certain movements. He carried out many exercises and finally ran across the lecture hall. This result as Mr. Poate explained had been achieved by the performance of Royle's operation of sympathetic ramisection in the right cervical and in both lumbar areas. The patient had had no hyoscine or other drug treatment since his first operation on December 12, 1925. Mr. Poate said that as a result of the abolition of conscious cortical effort in the three limbs operated on the left superior extremity had improved considerably and there was a conspicuous difference in the patient's facial expression from one of a typical hopeless dullard to that of a care-free, smiling man, shed of the great burden of the most crippling feature of his dread disease. It was worthy of note that since the first lumbar ramisection which was performed on the right side on December 22, 1925, the patient's bowel function had practically returned to normal. Although the patient was by no means restored to full health and strength, he was able to get about, feed and clothe himself and help in the ordinary ward work of a convalescent patient.

Electrocardiography.

DR. M. C. LIDWILL showed a series of tracings obtained by use of the electrocardiograph in various clinical conditions. He explained in detail the tracing from a normal patient and then demonstrated in turn tracings from cases of sinus arrhythmia, the early stage of heart block, drop beat in heart block, complete heart block, right bundle block, auricular extra systole, extra systole of the left ventricle and of the right ventricle and auricular fibrillation.

Actinomycosis.

DR. E. H. MOLESWORTH showed a female patient, aged forty-eight years, who had been admitted under his care on January 30, 1926. The patient had given a history of ulceration of the left buttock for nine months. The condition had started as a couple of boils which were opened, but refused to heal. Since that time the disease had spread over the whole of the left buttock and the loin. It was painless. The pus had been sterile on culture. Dr. Molesworth had thought that the disease might be actinomycosis, tuberculosis or *mycosis fungoides*. Repeated culture and bacteriological examination had yielded no information. A tuberculin test had been carried out, but no reaction was obtained. The serum had not reacted to the Wassermann test. X ray examination of the spine, pelvis and the neighbouring joints had revealed no abnormality. No sign of tuberculosis had been found on examination of the chest. The patient had then been discharged and transferred to a surgeon. She had been readmitted on April 20, 1926, under the care of Mr. McKelvey. The pus had again been sterile on culture. On April 22, 1926, a snipping taken from one of the granulomatous areas had been examined in section by Dr. V. R. Woodhill who had reported the presence of actinomycosis.

The patient was being treated with large doses of iodide of potash and with boracic foments. At the time of demonstration she was having 0·6 mil (ten minims) of a 10% solution of iodine in 95% alcohol three times a day in milk. She had no fever and was improving slightly under the treatment.

Polycythæmia.

DR. F. S. HANSMAN reported several cases of polycythæmia. An account of these cases will be published in a subsequent issue.

Meningococcal Meningitis.

DR. L. G. TEECE on behalf of DR. H. J. CLAYTON showed a female patient, aged twenty years, unmarried, who had suffered from meningococcal meningitis in October, 1925. She had been in hospital for four weeks, had been treated with serum and had recovered. Three months later she had complained of numbness of the legs and body up to the waist, of loss of power in the legs and of a stumbling gait and of wasting in the legs.

Dr. Teece pointed out that cranial nerves were normal, loss of power was present in both legs and this was most pronounced in flexion of the right knee. Spasticity was present in both legs and the gait was unsteady and spastic. Sensation of touch was normal. Sensation of pain was diminished from the seventh thoracic segment downwards. Thermal sensibility was impaired in both legs. The sense of position and the muscle sense were impaired in both legs. Incoordination was present. The plantar reflex was extensor in type, the knee jerks were exaggerated and both patellar clonus and ankle clonus were present. All the other systems were normal.

Treatment had been carried out by means of lumbar puncture, ten cubic centimetres of clear cerebro-spinal fluid not under increased pressure having been withdrawn. Neither organisms nor cells had been found in the fluid on microscopical examination. Ten cubic centimetres of antimeningococcal serum had been given intrathecally, thirty cubic centimetres had been given by intravenous injection and one hundred and eighty cubic centimetres by the subcutaneous route. The lower extremities had been put up in back splints with the feet at right angles and with ten degrees of flexion at the knees. A certain amount of improvement had been noted. There was increase of power in the legs, a diminution of spasticity was noted and sensation had improved.

Osteomyelitis of the Maxilla with Bilateral Nerve Deafness.

DR. G. R. HALLORAN showed a patient who was suffering from bilateral nerve deafness, the result of osteomyelitis of the maxilla. This case will be reported in full in a subsequent issue.

Skiagrams.

DR. H. R. SEAR showed a series of interesting skiagrams. He discussed briefly *osteochondritis deformans juvenilis*, treating it in a broad sense. The common type of this disease was that known as Perthes's disease of the hip. In Australia it was much more frequent than was generally supposed.

Dr. Sear showed skiagrams from typical cases in early and late stages.

A skiagram was shown in which there was the fragmentation typical of Perthes's disease, not only of both femoral heads, but of the epiphyses of the greater and lesser trochanters on both sides. The next most common type of this lesion

was that known as Köhler's disease and skiagrams were demonstrated showing early and late stages. In one skiagram Köhler's disease was seen with superimposed tuberculosis. This skiagram revealed absorption of the upper ends of the cuneiform bones.

Schlatter's disease (epiphysitis of the anterior tubercle of the tibia) was another type of the same condition.

Skiagrams were shown of cases of Calvé's or Schiedmann's disease of the spine. One was taken from a child and in this case the surgeon had not been able to reconcile the clinical signs with those of Pott's disease of the spine. Another was from an adult of advanced middle age, who had been treated in France for tuberculosis of the spine at the age of fourteen. The changes here were very typical of Calvé's disease and there was no evidence of any old tuberculous lesion in the spine.

A further skiagram was demonstrated showing changes in both acetabula which Dr. Sear regarded as the end result of a lesion similar to *osteochondritis deformans juvenilis*, but involving the acetabula and not the femoral heads.

Septicæmia.

DR. A. H. TEBBUTT, D.S.O., demonstrated some specimens from cases of septicæmia. An account of his demonsration will be published in a subsequent issue.

Ischæmic Necrosis.

DR. V. R. WOODHILL showed some specimens of ischæmic necrosis of cardiac muscle. An account of his remarks will be published in a subsequent issue.

NOMINATIONS AND ELECTIONS.

THE undermentioned have been nominated for election as members of the New South Wales Branch of the British Medical Association:

Chambers, George Alexander, M.B., Ch.M., 1925 (Univ. Sydney), Laurel Avenue, Epping.

Miller, Ian Douglas, M.B., 1924 (Univ. Sydney), 3, Burroway Street, Neutral Bay.

Wilson, Milford Graham, M.B., Ch.M., 1926 (Univ. Sydney), Loombra, Armidale.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A MEETING OF THE SENATE OF THE UNIVERSITY OF SYDNEY was held on June 14, 1926. The following degrees were conferred *in absentia*:

Master of Surgery (Ch.M.): B. R. V. Forbes, J. W. Ford, O. E. Nothling, R. G. Stanley.

The following diploma was awarded:

Diploma in Public Health: T. R. Pearce, M.B., Ch.M.

The following resolution was adopted relative to the death of Miss Eleanor Emily Chase, B.Sc. (late Lecturer and Demonstrator in Zoology):

> The Senate records with deep regret the death at an early age and after an illness tragically brief of Miss Eleanor Emily Chase, B.Sc., Lecturer and Demonstrator in Zoology.
>
> Miss Chase was appointed Junior Demonstrator in Zoology upon her graduation in 1917 and was in her tenth year of service. She was promoted Lecturer in 1923. She was a devoted, capable and conscientious teacher and bore the brunt of the teaching strain during the heavy years immediately following upon the war. She had small time for research, but had published one paper and was engaged upon an important piece of work at the time of her death.
>
> The refinement and quiet strength of her personality and her gracious presence endeared her to the large number of students who profited by contact with her. By her colleagues in the Department of Zoology she was well beloved. The University has lost by her passing an exemplar not easily to be replaced.

The Secretary of the Federal Capital Commission, Canberra, wrote expressing appreciation of the assistance given by the Vice-Chancellor (Sir Mungo MacCallum), in the matter of University education at Canberra.

A letter was received from Mr. A. M. Loewenthal forwarding a cheque for £10 10s. to cover two prizes of £5 5s. each for award in the Faculties of Medicine and Engineering. The gift was received with grateful thanks and the necessary action was taken to arrange the conditions of award of the prizes.

An invitation was received from the Council of the University of Sheffield to send one or two delegates to the Celebration of the Coming of Age of the University of Sheffield on 30th June and 1st and 2nd July, 1926.

The Registrar of the Nurses' Registration Board tendered to the Senate the appreciation of the Board for the cordial cooperation extended by the University to the Officers of the Board in connexion with the recent registration examination.

The resignation of Dr. H. C. Adams as Tutor in Anæsthetics at Sydney Hospital was received and accepted and Dr. E. H. Stokes was appointed to the vacancy.

Dr. Dixon Hughes was appointed as Honorary Demonstrator in the Department of Anatomy.

Mr. P. D. F. Murray, B.Sc., was appointed Lecturer and Demonstrator in the Department of Zoology. Mr. Murray graduated in 1922 with First Class Honours and the University Medal in Zoology and First Class Honours in Botany. He then proceeded to Oxford, where he obtained the degree of B.Sc. by research. On his return to Sydney he was awarded a Linnean Macleay Fellowship.

To the position of Lecturer and Demonstrator in Chemistry the Senate appointed Dr. Francis Lions, B.Sc. Dr. Lions graduated at Sydney in 1923 with First Class Honours in Chemistry and Organic Chemistry. He proceeded to England in that year to take up a scholarship given by the Royal Commissioners of the Exhibition of 1851. He graduated Doctor of Philosophy (Ph.D.) at the Victoria University of Manchester in July, 1925, after two years' research work under Professor R. Robinson, F.R.S. At present he is engaged in chemical research under Professor W. H. Perkin at the Dyson Perrins Laboratory of the University of Oxford.

Congress Notes.

THE AUSTRALASIAN MEDICAL CONGRESS (BRITISH MEDICAL ASSOCIATION).

Travelling Facilities by Sea.

IN our issue of June 12, 1926, we announced that the Union Steamship Company were making arrangements for the steamer journeying from Melbourne to New Zealand in February, 1927, at the time of the Dunedin session of the Australasian Medical Congress (British Medical Association) to call at Milford Sound both on the outward and return journeys. We learn from Dr. F. L. Davies, the Honorary Local Secretary for Victoria, that in response to inquiries it is stated by the Manager of the Union Steamship Company that while it is the present intention of the Company to arrange for the call at Milford Sound as mentioned above, there is no likelihood that the excursions to Milford Sound will be reinstated in the near future. Medical practitioners will note that the only opportunity of visiting the Sound will be that provided when the steamer sails carrying members to Congress.

Post-Graduate Work.

COURSE IN OBSTETRICS AND GYNÆCOLOGY IN MELBOURNE.

THE Honorary Secretaries of the Melbourne Permanent Committee for Post-Graduate Work announce that arrangements have been made by the Committee with the committee and staff of the Women's Hospital, Carlton, for the Hospital to be thrown open to post-graduate students during the two weeks commencing on August 12, 1926. No medical students will be at the Hospital at this time and all the work of the Hospital, including special clinical demonstrations, will be open to graduates both during the day and the night time.

Eight graduates will be accorded the privilege of residing at the Hospital for the same period. Should too many practitioners apply for admission to residence, it may be necessary to restrict the time allowed to each to one week.

The fee on registration for attendance at all demonstrations and for taking part in the work of the Hospital will be two guineas. The sum of four guineas will be charged for board and lodging payable in advance for those going into residence.

Members proposing to attend the course are asked to notify the Honorary Secretaries as soon as possible and to state whether they desire to go into residence at the Hospital or not. The fees should be forwarded with the application. The Honorary Secretaries are Dr. J. W. Dunbar Hooper and Dr. Harold Dew, 12, Collins Street, Melbourne.

Special Post-Graduate Lectures in Melbourne.

The Melbourne Permanent Committee for Post-Graduate Work has arranged with Professor F. Wood Jones, of the University of Adelaide, to deliver four lectures on "Some Wider Problems Connected with the Central Nervous System." The lectures will be delivered at the Medical Society Hall, East Melbourne, on September 3, 6, 8 and 10, 1926, at 8.30 o'clock in the evening. The fee for attendance will be two guineas. Applications for admission should be made to the Honorary Secretaries of the Committee.

Correspondence.

PITUITRIN IN OBSTETRICS.

SIR: Under the above heading in "Current Comment" of June 19 issue of the journal it states that: "Occasional warnings have been issued on the ground that rupture of the uterus is liable to occur if undue obstruction to the expulsion of the fœtus is present." The following case

Public Health.

THE HEALTH OF AUSTRALIA.

INFECTIVE DISEASES NOTIFIED IN AUSTRALIA DURING THE YEAR ENDED DECEMBER 31, 1925.

Infective Diseases.	New South Wales.		Victoria.		Queensland.		South Australia.		Western Australia.		Tasmania.		Commonwealth.	
	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.	Deaths.	Cases.[1]	Deaths.
Enteric Fever	541	80	164	19	285	38	86	15	236	12	47	6	1,359	170
Scarlet Fever	2,767	27	1,236	17	385	6	278	2	127	0	281	3	5,074	55
Diphtheria	2,778	119	2,448	69	1,404	46	404	19	361	6	476	13	7,871	273[2]
Pulmonary Tuberculosis[3]	1,208	1,042	1,042	930	360	341	541	322	427	256	184	110	—	2,994[4]
C'bro-Spinal Meningitis	35	30	23	32	22	17	4	2	2	0	4	2	90	83
Poliomyelitis	51	14	129	27	44	12	13	3	18	1	1	1	256	58
Malaria	—	2	0	2	3	24	2	0	34	3	0	1	—	35[5]
Puerperal Fever	—	107	26	46	42	32	63	27	21	14	16	10	—	236
Septicæmia, Sapræmia, Pyæmia	—	45	—	28	—	24	—	12	25	10	—	8	—	127
Bilharziosis	—	—	0	0	0	0	0	0	0	0	0	0	—	0
Morbilli	—	30	—	46	—	9	14,785	45	—	—	—	—	—	130
Pertusis	—	318	—	42	—	55	185	6	—	14	—	27	—	463[6]
Ophthalmia Neonatorum	—	—	—	—	—	—	—	—	8	0	5	0	—	—
Anchylostomiasis	—	1	0	0	1	2	—	—	—	—	—	—	—	3
Beri Beri	—	—	—	—	—	3	—	—	16	4	—	—	—	8[7]
Low or Cont'nued Fever	—	—	—	—	0	0	0	0	2	0	—	—	—	—
Pneumonia	—	—	—	—	—	—	—	—	0	0	—	—	—	—
Influenza	—	—	—	—	—	—	74	0	0	0	0	0	—	—
Dengue Fever	—	—	—	—	—	—	—	—	0	0	—	—	—	—
Eencephalitis Lethargica	—	—	22	0	—	—	—	—	1	0	1	0	—	—
Erysipelas	—	—	—	—	132	0	171	0	105	0	—	—	—	—
Dysentery	—	—	32	0	7	0	0	0	11	0	—	—	—	—
Cholera	—	—	0	0	0	0	0	0	0	0	0	0	—	—
Hæmaturia	—	—	—	—	6	0	0	0	3	0	0	0	—	—
Small Pox	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Plague	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anthrax	—	—	3	0	—	—	1	0	0	0	—	—	—	—
Tetanus	—	—	7	—	—	—	—	—	—	—	—	—	—	—
Varicella	—	3	—	—	—	3	262	0	—	—	—	—	—	6
Granuloma	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Leprosy	0	0	0	0	0	0	0	0	3	0	0	0	—	—

[1] The total number is not given of those diseases which are not notifiable in all the States.
[2] Includes one death in the Northern Territory.
[3] Notifiable only in portion of the State.
[4] Includes eleven deaths in the Northern Territory.
[5] Includes three deaths in the Northern Territory.
[6] Includes one death in the Federal Capital Territory.
[7] Includes one death in the Northern Territory.

shows that there is another although rare danger in pituitrin injections during labour apart from rupture of the uterus.

A young, healthy *multipara* in normal labour was given one cubic centimetre of pituitrin hypodermically in one injection at the commencement of the third stage. A few minutes afterwards the patient suddenly collapsed and died. The *post mortem* examination disclosed no sign of any disease or injury to the parturient canal. The history of the other confinements was normal. The medical practitioner was a man of experience in midwifery work and the pathologist who made the autopsy and by whose courtesy I saw the *post mortem* examination of the body, is recognized as an authority.

Yours, etc.,

W. A. T. LIND.

Kew, Victoria,
June 21, 1926.

HOSPITAL PRACTICE.

SIR: In your issue of even date a letter from Doctor C. H. Jaede, of Pymble, New South Wales, is published, complaining of the difficulty he experiences in obtaining information about patients sent for treatment to public hospitals. Most other practitioners have experienced the same difficulty and in order to attempt a remedy, in 1921 I approached the Council of the Victorian Branch of the British Medical Association, suggesting that a routine medical form should be adopted for the use of practitioners sending patients to public hospitals, with a "tear-off" sheet for use of the hospital resident or honorary staff to report to the practitioner on or before the return of the patient. The form was to be accompanied by a stamped envelope addressed to the sender. At the request of the Council I drew up a form which was adopted by the Council, and also accepted for routine use by the staffs of the Melbourne public hospitals. This form of which I attach a copy, has been in routine use in Victoria since early in 1922 and supplies can be obtained at a moderate cost from the Victorian Branch. During the last four years in my private and departmental practice I have used more than a thousand of these forms and in only one instance did the staff of the hospital concerned fail to supply a full and satisfactory report on the patient's progress. It is an interesting commentary on human nature to note that the individuals to whom this system means most extra work and who derive least benefit from it, namely the honorary and resident medical officers of the hospitals, have shown the greatest enthusiasm for the idea and have spared no pains to make it a success which it undoubtedly has been when used.

On the other hand the general body of practitioners who might be expected to appreciate the saving of time to themselves and the very real and certain benefit to their patients, have shown but slight interest in the matter and very few indeed have availed themselves of the forms.

The really great help I have derived from their use, particularly in departmental work, makes me hope that, when the present generation of residents go out into practice, they will make use of them in suitable cases.

A growing experience of the difficulty of making a clinical diagnosis without a record of previous medical history, treatment *et cetera*, as when a child is sent to hospital with no report from the doctor in attendance, leads me to believe that our medical and surgical results fall short of the ideal nearly as much for want of proper liaison between those giving medical attention at various times and places as for want of the requisite knowledge and care. These latter factors are provided for in our training and are only upset by the element of human error, but the liaison, important though it is, is a purely mechanical thing and requires for its success only the will to achieve it and, incidentally give the patient the best chance of obtaining the right treatment at the right time.

Yours, etc.,

A. P. DERHAM.

105, Collins Street, Melbourne,
June 12, 1926.

Obituary.

HERBERT CLATWORTHY.

IN our issue of July 3, 1926, we announced the death of Dr. Herbert Clatworthy. By his passing the medical profession has lost one of its unobtrusive yet faithful members.

Herbert Clatworthy was born in Chatham, Kent, in 1859. He was a son of the late Ebenezer Clatworthy and was educated at Mill Hill School. He subsequently studied medicine and became licentiate of the Society of Apothecaries in 1880. In the following year he was admitted to membership of the Royal College of Surgeons of England. Subsequently he became house surgeon at the London Hospital. After leaving this institution he served for a time as medical officer on the "ships" anchored in the river Thames for the treatment of patients suffering from small pox. He found this work of great interest and frequently referred to it in later years. In 1885 he came to Australia with his wife and settled at Beenleigh, in southern Queensland. Subsequently he was appointed resident surgeon to the Townsville Hospital, a position of importance and responsibility. In 1891 he went to Charters Towers then in its prosperous days. Here he worked hard for twelve years. Medical practice in this northern mining town was strenuous and Herbert Clatworthy built up a sound and successful practice. After leaving Charters Towers he settled for five or six years at Kangaroo Point, Brisbane. Eventually he came to Sydney and practised at Artarmon. Two years ago he retired on account of ill-health. He was suffering from *angina pectoris*, a disease which has claimed so many doctors as its victims.

Herbert Clatworthy lived quietly and conducted his practice with diligence. He was never robust and was thus denied many pleasures enjoyed by others. He essayed both golf and tennis, but was compelled to leave them both alone. He loved his garden and found solace in his books. At the same time he was fond of music and belonged for some years to the Charters Towers Philharmonic Society, famous throughout the north as "The Curlews" in eisteddfod competitions. Latterly he was a member of "The Orphans," a North Sydney musical association of men. Herbert Claworthy leaves a widow and two sons, one of whom is a member of the medical profession.

Honours.

BIRTHDAY HONOURS.

THE list of "birthday honours" delayed on account of the general strike in England has been issued last week. It is with much gratification that we learn that His Majesty the King has created Sir Alexander MacCormick a Knight Commander of the Order of Saint Michael and Saint George. Sir Alexander was created a Knight Bachelor in 1913. His distinguished services to the community as a surgeon, his patriotic and self-sacrificing work during the Great War and his manifold and generous gifts to charitable institutions have demanded a public recognition. We tender to him the congratulations of the medical profession in the Commonwealth.

THE KAISIR-I-HIND MEDAL.

WE learn that Dr. Effie Stillwell, a graduate of the Melbourne University, has recently been awarded the Kaisir-i-Hind Medal in recognition of her valuable public services as a medical missionary during the past twenty years in Papua. Her contemporaries and those with whom she has come in contact in the course of her career, will join us in conveying congratulations to her.

NOTICE.

MEMBERS of the Queensland Branch of the British Medical Association are informed that the annual dinner of the Branch will be held at the Belle Vue Hotel, Brisbane, on August 5, 1926, at 7.15 p.m. Tickets (at eleven shillings each, exclusive of wine) can be obtained from the Honorary Secretary, Dr. E. S. Meyers. Dr. J. L. McKelvey, of Sydney, will be the guest of honour.

HOSPITAL SATURDAY FUND IN NEW SOUTH WALES.

IT has been announced that the Hospital Saturday Fund in New South Wales raised during the year ended May 31, 1926, the sum of over £37,300 and that this amount is likely to be increased by about £300 when certain promised sums of money are paid. The collections in the suburbs of Sydney on April 30, 1926, realized close on £4,300, while the collections in Sydney itself produced over £7,260. During the year £18,250 was collected from the employees in offices, workshops and public departments. It is stated that the Fund has paid to the metropolitan hospitals £11,855 toward the cost of maintenance of employees who subscribe to the Fund. While it is eminently satisfactory that the support of the charitable on behalf of the public hospitals where the indigent sick receive medical treatment free of cost, is still substantial, the granting of the right of subscribers to the Fund to claim admission to these same hospitals is tending to alter the character of these institutions. There are many indications that in the near future the public hospitals will cease to be run on eleemosynary lines. When that time arrives, the public will refrain from giving large sums of money to the hospitals and no doubt the medical profession will reconsider whether gratuitous service should be extended to the patients in the institutions.

Books Received.

ABDOMINAL OPERATIONS, by Sir Berkeley Moynihan: Volumes I. and II., Fourth Edition, Revised; 1926. Philadelphia: W. B. Saunders Company; Melbourne: James Little. Royal 8vo., pp. 1217, with illustrations. Price: £5 net.

THE ENDOCRINE ORGANS: AN INTRODUCTION TO THE STUDY OF INTERNAL SECRETION, by Sir E. Sharpey-Schafer, LL.D., D.Sc., M.D., F.R.S.; Second Edition. Part II.; 1926. London: Longmans, Green and Company, Limited. Crown 4to., pp. 260, with illustrations. Price: 20s. net.

HUMAN PHYSIOLOGY, by John Thorton, M.A.; Third Edition, Completely Revised by William A. M. Smart, M.B., B.S., B.Sc., M.R.C.S. (England), L.R.C.P. (London); 1926. London: Longmans, Green and Company, Limited. Demy 8vo., pp. 463, with illustrations. Price: 10s. 6d. net.

Medical Appointments.

The undermentioned have been appointed Members of the Medical Board of South Australia: Dr. Alfred Austin Lendon (B.M.A.), Dr. Bedlington Howel Morris (B.M.A.), Dr. Richard Sanders Rogers (B.M.A.), Dr. Herbert Henry Ernest Russell (B.M.A.), Dr. William Thornborough Hayward (B.M.A.).

* * * *

Dr. Francis Stanislaus Loughnan (B.M.A.) has been appointed Public Vaccinator at Broadford, Victoria.

* * * *

Dr. David Hastings Young (B.M.A.) has been appointed Public Vaccinator at Sorrento, Victoria.

Medical Appointments Vacant, etc.

FOR announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xxii.

REPATRIATION COMMISSION: Resident Medical Officer.
ROYAL AUSTRALIAN AIR FORCE: Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association.
QUEENSLAND: Honorary Secretary B.M.A. Building, Adelaide Street, Brisbane.	Brisbane United Friendly Society Institute. Stannary Hills Hospital. Cook District Hospital.
SOUTH AUSTRALIAN: Honorary Secretary, 12, North Terrace, Adelaide.	Contract Practice Appointments at Ceduna, Wudinna (Central Eyre's Peninsula), Murat Bay and other West Coast of South Australia Districts.
WESTERN AUSTRALIAN: Honorary Secretary, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

JULY 13.—Tasmanian Branch, B.M.A.: Branch.
JULY 13.—New South Wales Branch, B.M.A.: Ethics Committee.
JULY 13.—Section of Medicine, New South Wales.
JULY 14.—Northern Suburbs Medical Association, New South Wales.
JULY 15.—Section of Neurology and Psychiatry, New South Wales.
JULY 19.—New South Wales Branch, B.M.A.: Organization and Science Committee.
JULY 20.—Tasmanian Branch, B.M.A.: Council.
JULY 20.—New South Wales Branch, B.M.A.: Executive and Finance Committee.
JULY 21.—Western Australian Branch, B.M.A.: Branch.
JULY 21.—Central Northern Medical Association, New South Wales.
JULY 23.—Queensland Branch, B.M.A.: Council.
JULY 27.—New South Wales Branch, B.M.A.: Medical Politics Committee.
JULY 27.—Illawarra Suburbs Medical Association, New South Wales.
JULY 28.—Victorian Branch, B.M.A.: Council.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

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